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ANNUAL REPORT
OF THE
Board of Health



1877

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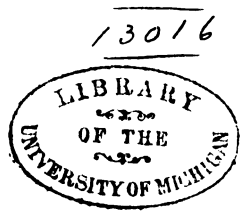
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FIFTH ANNUAL REPORT

OF THE

BOARD OF HEALTH

OF THE

CITY OF BOSTON,

FOR THE YEAR ENDING APRIL 30, 1877.



BOSTON :
ROCKWELL AND CHURCHILL, CITY PRINTERS,
No. 39 ARCH STREET.
1877.

HENRY G. CROWELL.

ALONZO S. WALLACE, M.D., *Port Physician.*

Abstract

CONTENTS.

	PAGE
ABATTOIR, REGULATIONS FOR THE GOVERNMENT OF	22
ADULTERATION OF FOOD	23
AMBULANCE FOR PUBLIC USE	12
APPOINTMENTS	64
CELLARS	5
CEMETERIES	17
CITY PHYSICIAN, REPORT OF	71
DIPHTHERIA	47
FINANCIAL STATEMENT	67
FISH-PEDLERS, ETC.	10
HIDES AND HORNS	11
HOUSES VACATED	9
INFANT BOARDING	16
INSPECTION OF PROVISIONS	19
LYING-IN HOSPITALS	17
MORTALITY STATISTICS	28
NUISANCES AND TENEMENT-HOUSES	7
PORT PHYSICIAN, REPORT OF	75
PROSECUTIONS	10
PUBLIC AMBULANCE	12
PUBLIC URINALS	10
QUARANTINE DEPARTMENT	62
REGULATIONS	65
REMOVAL OF NIGHT-SOIL	11
RENDERING ESTABLISHMENTS	12
SCARLET-FEVER	56
SCHOOL-HOUSES	15
SEWERAGE	1
SLAUGHTERING ESTABLISHMENTS	11
SMALL-POX	27
SUPERINTENDENT OF HEALTH, REPORT OF	85
TENEMENT-HOUSES AND NUISANCES	7
TRAMPS	14
URINALS	10
VACCINATION	13
WET CELLARS	5



CITY OF BOSTON.

City Document No. 67.

FIFTH ANNUAL REPORT OF THE BOARD OF HEALTH OF THE CITY OF BOSTON.

May 1, 1877.

TO THE CITY COUNCIL OF BOSTON :—

Agreeably to the ordinances relating to the public health, we herewith submit our annual report for the year ending April 30, 1877. During the year our attention has been given, as usual, to such matters as are comprehended in the abatement of nuisances, examination of vacant lots, drains, offensive trades, tenement-houses, small-pox, scarlet fever, fish-pedlers, grease-collectors, removal of manure, care of burial-grounds, infant boarding-houses, lying-in hospitals, adulteration of food, and quarantine. Some of the subjects mentioned require a more extended notice, as will be seen elsewhere.

SEWERAGE.

The subject of improved sewerage for Boston has never been omitted in any of our annual reports, and we cannot be silent now, since it is our first and greatest desire to see this great work, the most important in our day, begun and completed at the earliest possible moment.

It is our duty to lose no opportunity to impress upon you not only the present, but the immensely increasing, demand for a system of sewerage worthy of the name. We have not such a system to-day, and we can ill-afford to wait for the time necessary to make one.

It is now two years since the City Council took the first, and a very important, step in this direction, by appointing a commission of experts, who at an early day presented the Council with the groundwork, if not the best possible plan, for the construction of a complete system of sewerage.

It is unnecessary to say that the poor of Boston are to-day not only suffering for want of work, but suffering from the foul sewer stench, against which this very work should be

directed. It is too true, and is already too sadly felt in the light of poverty and sickness.

It is also unnecessary to say that the moneyed men of Boston, who are to bear the expense, the medical profession, who are daily witnessing its great need, and the thinking community at large, have often and loudly spoken in favor of an immediate beginning of this great work.

The diminishing value of real estate in insalubrious but costly parts of our city, as well as our too high death-rate, from preventable causes, demands it without delay.

The Back Bay, so called, now a very hackneyed subject, continues to demand a great deal of attention and is an almost constant source of complaint.

Temporary measures have been resorted to by the Board of Health from year to year, with more or less good effect in mitigating this great nuisance.

Desiring that this question should be considered by the City Council, and in deference thereto, the following statement and recommendations were made to the Council in March last : —

OFFICE OF THE BOARD OF HEALTH,

BOSTON, March 19, 1877.

TO HIS HONOR THE MAYOR AND CITY COUNCIL OF BOSTON : —

Gentlemen, — The Board of Health respectfully invites the attention of your honorable bodies to a section of the Back Bay, so called, which demands some early action on the part of the city. For many years portions of the south and west ends of our city have suffered during the warm season from intermittent stench, which have been attributed to a variety of sources.

The first experience of the Board of Health with the section referred to was in 1873, when the residents west of Arlington street complained of bad odors coming to them with westerly winds.

Investigation showed that a large portion of the Back Bay was in a state of nuisance ; but one section, consisting of foul water and mud, shut off from the tide near the junction of Commonwealth avenue and Parker street, was much worse than the rest. The Board caused the tide-water to flow in and out daily, and the complaint ceased for that season. This section has since been entirely filled with clean gravel.

In 1874 the flats about Parker street were seriously complained of. The city was indicted for maintaining a nuisance, and the Board of Alderman ordered that the channel across the flats from the mouth of Stony-brook river be deepened. The season passed without further action, and in December the Board of Health called the attention of the City Council to the same nuisance, in a communication on improved sewerage.

In 1875 complaints were again made, and the Board of Health adopted the cheapest expedient within its reach, by erecting a stone dam about six feet high at the Beacon-street sluiceway. This was sufficient to cover the flats at low water and still allow a considerable change of water at each flow of the tide. This measure brought immediate relief, but it was not without an objectionable feature, inasmuch as it caused a more rapid deposit of the large amount of sewage which was turned into this body of shoal water from the Highland district and Brookline.

The relief lasted, however, for nearly two seasons, or until last fall, when the people of a large section of the South End were much disturbed and sickened by the foul odors which came directly from the Back bay in the region of the mouth of Stony-brook sewer.

The Board of Health made repeated visits and found that for acres in extent the water about the Stony-brook sewer was turbid and foul, to a sickening degree.

There was also a large creek, twenty or thirty feet wide, extending from Parker street south-easterly about 2,000 feet to the Boston & Providence Railroad. This creek receives the sewage of the Berlin-street district, and is also subject to the flow of the Stony-brook sewage at every flood tide. In degree of nuisance it is second only to the Roxbury canal. The filthy waters of this whole section are agitated by the prevailing westerly winds of summer and autumn, and the stench is carried directly to the dwellings of a large part of the South End, whose residents bitterly complain. There are two reasons for expecting that the nuisance from this source will be far greater the coming season than ever before. One, is that the stone dam at the sluiceway had to be removed last fall, to allow a more thorough change of water and scour of the channel through the winter, leaving the flats bare at low tide. The other is, that, in addition to the accumulation of many years upon these flats and in the creeks, the flow of sewage is now greater than ever before.

We would respectfully recommend that, until the prospective system of sewerage which we confidently hope for is completed, there be temporary means used to keep the flats covered, by gates at the sluiceway or otherwise, and that the creek leading from Parker street to the Boston & Providence Railroad be filled with gravel, and the Berlin-street sewer (made of plank) extended to Parker street.

S. H. DURGIN,

Chairman.

The communication was referred to the Committee on Health, who, after consideration, concluded to leave the matter with the Board of Health, recommending the rebuilding of the stone dam at the sluiceway.

The re-erection of the stone dam at the sluiceway, by which the flats may be kept covered with water, is anticipated for the coming season, and will no doubt in some degree lessen the evil; but we cannot expect from such means the same amount of relief which they have given in years past.

The flats have now become so filled and loaded with filth, that a shoal covering of water will give but partial protection against the gases which are constantly rising from this foul mud of a hundred acres.

If no more sewage from this time should be discharged upon these flats there would be immediate improvement, although it would even then take years for the water to dissipate entirely the foulness of this mud; but with the present vast flow of sewage from thirty thousand inhabitants, together with the drainage of many large manufacturing establishments, breweries, etc., into this mere precipitating basin of shoal water, the outlook is anything but encouraging, and

will be until some radical and decisive measure is taken, by which the entire sewage of this section of the city will be conducted elsewhere into deep water.

Roxbury canal still remains prominent among the nuisances of Boston.

Leading in from the South Bay, five or six rods wide, and extending several thousand feet, to Harrison avenue, we find this great slough or open sewer in the midst of a thickly populated section. The sewage and mire lie, a fathom deep, bubbling their gases through the black, putrid water, while the lighter and soluble portions of filth are slowly surging back and forth with the rising and falling of the tide. The sight of this canal from the Albany-street bridge is sufficient to nauseate any decent man, and it is said that horses even have refused to cross the bridge over this slough.

We would gladly pass over this subject without a word of complaint, but duty forbids, even though we have besought its remedy for four years in vain. Business and dwelling are alike rendered exceedingly uncomfortable and unhealthy in the whole neighborhood at times, including one of the most beneficent and well-managed institutions in New England, where two hundred and fifty patients lie blessed with everything which an intelligent and worthy Board of Trustees and Hospital Staff can supply, yet deprived of nature's greatest gift, — pure air.

Last fall the medical staff of the City Hospital, together with other physicians and people of that neighborhood, petitioned the City Council for relief from this canal nuisance. Thereupon the City Council asked the Legislature for authority to fill the canal, as a remedy for the trouble. The legislative Committee on Harbors to whom the subject was referred, gave a long and patient hearing on the subject, reported in favor of the petitioners, and the Legislature then granted authority to the City Council to take the land and fill the canal.

We cannot think the present City Council, knowing the nature and extent of this nuisance, and having the power in their hands to abate it, will allow the people of that neighborhood to pass through another season with this open sewer in their midst.

Another serious nuisance, which has brought numerous complaints of citizens, directly and indirectly, to the Board of Health, exists between the Eastern Railroad and Canal street in the Charlestown District.

Two years ago the greatest nuisance in that section was adjoining the State Prison, and was due to two or three acres of sewage flats, which were left bare at low tide, and which

gave off the most unbearable stench. This property belonged to the Commonwealth, and was in charge of the prison inspectors, who were duly notified to abate the nuisance, but, failing to do so, the Board of Health was obliged to contract for the work, and abated the nuisance by filling the flats to a grade above high water. For this work the city now has a bill against the State for about nine thousand dollars.

Since then the complaints have generally designated the Mill-pond flats as the source of the nuisance; but on careful and repeated examinations of the Board of Health, the nuisance is not found upon the Mill-pond flats in any degree. But below the dam of the Mill-pond, all the way to near the prison, there are flats which are left bare at low tide, upon which the sewage that formerly lodged near the prison is now rapidly accumulating, and from which a very considerable nuisance must arise.

We recommend the abatement of this nuisance by the City Council as our appropriation is insufficient for a work of such magnitude.

WET CELLARS.

The sanitary condition of dwellings which are periodically affected by tide-water and the overflow of Stony brook has for years been the cause of serious complaint. These two evils cannot be remedied except by a large expenditure of money. While this Board has, by statute law, undoubted authority to "destroy, remove, or prevent, all nuisances, sources of filth, and causes of sickness," within the city, yet when questions of the magnitude of the above arise, requiring so large an outlay, we have deemed it prudent to communicate the facts to your honorable body, and await your action, rather than expend so large an amount, as would be required in such instances, without first obtaining your approval.

On the 10th of April, we received from your honorable body the following communication: —

CITY OF BOSTON.

IN BOARD OF ALDERMEN, April 10, 1877.

Ordered. That the Board of Health be requested to examine the cellars and dwellings along the borders of Stony brook in Ward 23, and report to the City Council, as early as may be, to what extent said cellars and dwellings are affected by the overflow of said brook; also to report whether, in the opinion of the Board, the condition of the cellars

is such as to jeopardize the health of the occupants of the dwellings, and thus affect the sanitary condition of the above-named locality.

Passed in Common Council.

Came up for concurrence.

Read and concurred.

Approved by the Mayor April 10, 1877.

A true copy.

Attest:

S. F. McCLEARY,
City Clerk.

In reply to the above we sent the following communication: —

OFFICE OF THE BOARD OF HEALTH.

April 19, 1877.

TO THE HONORABLE THE CITY COUNCIL OF BOSTON: —

Gentlemen, — In compliance with an order of the City Council, passed the 10th inst., requesting the Board of Health to examine the cellars and dwellings along the borders of Stony brook, in Ward 23, we beg leave to state that the premises have been examined, with the following result.

On Lamartine, Washington, Boylston, Keys and Green streets, Boylston, Union, Greenwood, and Brookline avenues, we found over one hundred dwellings whose cellars were flooded during the recent high state of Stony brook, to the extent of from two inches to three feet of water in depth, which remained in said cellars from two or three days to three weeks. The evidence showed that the same condition of the cellars occurred whenever the brook had suddenly been raised. From the examination made, and the evidence obtained, we are satisfied that of 124 dwellings examined, at least 100 cellars were flooded as above stated by the high state of Stony brook. It is a well-established fact that wet cellars and damp dwellings are prejudicial to health, and it is the unqualified opinion of the Board of Health, that the recent and present condition of the above-mentioned cellars and premises was and is such as to jeopardize the health of those living over them, and that some remedy against the evil should be applied.

Respectfully submitted,

S. H. DURGIN,
Chairman.

A large number of dwellings at the South End are in a much worse condition from tide, sewage, and surface water; whenever there is a heavy rainfall at high tide many of them are unfit for occupancy. The number is so large that the Board has hesitated to order them vacated. The cellars are wet; the dwellings damp; the walls become covered with mould, and the rooms filled with the sickening odors of decaying vegetable matter.

That something should be done to relieve the occupants of these dwellings there can be no question.

We believe that the only effectual remedy for these two evils is: —

1st. The laying of the proposed marginal sewer, to exclude the tide water.

2d. The widening, straightening, and deepening of the channel of Stony brook, to prevent its overflow.

We beg to urge upon your honorable body the necessity of some immediate action in this matter, and trust no time will be lost in applying the proper remedies.

TENEMENT HOUSES AND NUISANCES.

During the past year the 2,700 tenement houses in the city have been carefully inspected throughout five times.

In explanation of this work, it should be understood that a tenement house, as defined by the statutes, "*shall be taken to mean and include every house, building, or portion thereof, which is rented, leased, let, or hired out to be occupied, or is occupied, as the house or residence of more than three families, living independently of one another, and doing their cooking upon the premises; or by more than two families upon a floor, so living and cooking, but having a common right in the halls, stairways, yards, water-closets, or privies, or some of them.*"

The inspection of a tenement house requires the examination of the yard, privies, receptacles for garbage, cellar drainage, floors, stairs, roof, whitewashing, and ventilation. Upon the first inspection of a tenement house, the officer is required, in addition, to get the date when it was built, the material, number of stories in height, rooms, families, adults, and children; whether a water-closet or vault is provided for the occupants, number of rooms in the cellar, how many persons occupy the same, and the condition of repair in which the house is at the time of the officer's visit, — of which a record is kept in the office.

Many of these houses require and have a more frequent inspection, as often sometimes as once a week. The effect of frequent inspections is to improve the habits of many of the occupants, whose dislike at being annoyed by notices from City Hall is greater than that of keeping clean, and, choosing the lesser evil, they keep clean.

Our experience with tenement houses is that some are always clean, and some are always filthy, notwithstanding the efforts made to keep them in a condition of at least passable cleanliness. In many cases, the filthy condition is entirely owing to the negligence of the occupants. In some cases it is the fault of the landlord, who fails to provide means, common to every house, by which the efforts of the occupants are facilitated. It is a pleasure to state that most

of the landlords are anxious to keep their premises in good condition, and respond at once to the notices from the Board of Health.

A large number of the tenement houses are occupied by poor people, without the means to move when dissatisfied or discomfited, and they are therefore obliged to endure the odors arising from defective drains, imperfect waste-pipes, or other causes for which they are not responsible. It is to be regretted that there are landlords who are so lost to the consideration of the health and comfort of their tenants as to require the enforcement of the extreme measures of the law; but the records of our office show that in some instances it is so.

As an illustration of the difficulty with some of the landlords, an extreme case is selected: the property, consisting of four large tenement houses, contains, when fully occupied, sixteen families. The owner is a clergyman in Providence. The attention of the owner having been called to their condition, the customary notice was sent, and a reply returned that his agent had been directed to repair, etc., to the satisfaction of the Board of Health, and requesting that a delay might be made in the proceedings. As this seemed a reasonable request, the delay was granted. After the lapse of ten days the houses were again visited, and nothing was found to have been done; a second notice was sent to the owner, who replied again that his agent had been directed to fix the premises, and in the same letter gave the address of said agent. The agent was called upon, and informed the officer that he had no instructions to spend any money, and that the directions from the owner were so vague that he would assume no responsibility in the matter; whereupon the owner was written to of this fact, and that, unless something was done at once, the Board of Health would feel compelled to cause the premises to be vacated. In answer to this a letter was received, saying he thought it was an injustice, and that taxation was high, etc., and that the city was unreasonable in expecting him to make palaces for these people to live in. After another delay of a few days, orders were issued for the occupants to leave the premises, whereupon the owner came to Boston, and expressed his willingness to put the premises in order. A mason was employed to go to work, but it was weeks before the houses were fit to live in, and then only after a second order to vacate had been issued by us. There has been scarcely a month during the last three years that the efforts of this Board have not been required to improve the condition of this same estate.

Similar trouble is experienced in the abatement of nuisances

which comprise stagnant water on vacant lots, defective drainage, defective vaults, filthy cellars, and all sorts and kinds of nuisances not specified in the "Tenement-house Law."

During the year each street, court, lane, alley, and yard in the city has been visited by the inspectors four times, and some a much larger number. In warm weather the complaints made at the office are so numerous as to prevent anything like a systematic inspection of the yards and alleys, the officers being engaged their whole time investigating the causes, oftentimes very complicated, of nuisances reported by citizens. In no case is a notice to abate a nuisance issued from this office until after the inspection and report of an officer. As this fact is not generally known, it leads to some ludicrous denials of the existence of a nuisance, when the most indisputable evidence to the contrary is in our possession. The same experience is met in the abatement of nuisances in general as in the case of tenement houses. People who complain of a nuisance are oftentimes much exercised at the apparent delay in its abatement, having no knowledge of the difficulties to be overcome before the work can be accomplished. It is not always an easy matter to get at the owner or agent of premises.

It frequently happens that the nuisance is of such a magnitude as to exceed the limits of the appropriation, in which case the matter is brought to the attention of the City Council. There are some cases examined where the imagination has much to do with the complaint, and others where the informer is responsible, and is endeavoring to shirk the responsibility. Very many complaints are made by tenants against their landlords when the occupants are wholly in fault. All of these cases have to be examined with circumspection, that no hardship or injustice be done, and it is often very difficult to determine just what to do.

HOUSES VACATED.

The number of houses and cellars ordered vacated was 56. The number actually vacated, 29. The chief causes were defective drainage, want of repair, and defective and offensive vaults. The 27 not vacated were put in proper sanitary condition before the expiration of the time given in the notice to vacate.

The work of disinfecting or deodorizing foul places was begun in June, and continued all the time until November, during which, vaults, drains, yards, lanes, alleys, passage-

ways, cellars, cesspools, vacant lots, gutters, urinals, etc., etc., were attended to.

Chloride of lime, and sometimes other disinfecting powders, so-called, are used to a small extent; but the sulphate of iron (copperas) in solution is used in very large quantities. Nine open hogsheads for this purpose are kept full of a saturated solution of copperas throughout the season. This is done by keeping about three or four hundred pounds of copperas dissolving in the bottom of the hogshead all of the time, agitating and renewing the contents daily, or often as may be required. From these tanks the liquid is taken into a large cask, mounted upon a wagon, and driven to its place of use. The best copperas is used, is bought in quantities of fifty to one hundred barrels at a time, and costs us, delivered, one and a quarter to one and three-fourths cents per pound.

By this work thousands of places are rendered inoffensive if not harmless.

PROSECUTIONS.

The number of complaints for violation of health laws was 50; of these, 6 were made by the Inspector of Provisions. The amount of fines and costs was \$569.75.

PUBLIC URINALS.

No new urinals have been built during the year. A law passed the Legislature last year, authorizing the City of Boston to erect and maintain urinals for public use in any street, way, court, etc., in the city.

In September last we petitioned your body for leave to erect these in certain places, but, although an appropriation was made therefor, we have, up to this time, received no answer to our petition.

FISH-PEDLERS, ETC.

Fish-peddling and grease-collecting in the streets have been attended with a less number of complaints than usual. The number licensed to peddle fish during the year was 748. The number licensed to collect grease 167. All persons licensed are required to keep their carts in a cleanly condition; and to secure this they are licensed for only one month at a time, and are required to report, with their teams, on the first of each month, at the West-end stables, there to be inspected by an officer of the Board before renewal of the license.

HIDES AND HORNS.

Places where green hides and horns are stored have been inspected frequently during the warm season, and as a rule there has been less to complain of than in former years. More strict attention is given to cleanliness in handling and storing, and in some instances there have been great improvements in the store-rooms. There are at present 18 places where green or green-salted hides are stored.

REMOVAL OF NIGHT-SOIL.

In all cases where practicable, night-soil has been removed by the odorless excavating process, and, so far as we know, the contractors have been faithful in their duty. The number of vaults emptied was 3,503.

The removal of manure from stables in the city is still attended with more or less annoyance, especially to those who reside in close proximity to the stables.

The Board of Health has restricted the business by regulation as far as it seems to be practicable under present conditions, by enlarging the opportunity for removal and restraining the loose manner of it.

The great drawback lies in the construction of the stable wherein no provision is made for loading the manure inside. Pitching stable manure upon the sidewalk or upon any street, lane, or alley, makes a nuisance to abutters which no one has a right to inflict, but which is tolerated because the stable-owner has no other place for loading. We recognize the necessity for stables throughout the city, and also the necessity of removing manure therefrom; and we believe the people about them, as a rule, appreciate the advantage, and would, as far as possible, tolerate the necessary nuisance connected with them; but that this nuisance should be reduced to its minimum is only a reasonable demand.

We would respectfully recommend that, in all cases where permits are given by the City Council for building or altering stables, a provision be made for loading manure inside. If this could be done, any other unreasonable annoyance in removing manure would be easily remedied by us, and the removal by night be properly abandoned.

SLAUGHTERING ESTABLISHMENTS.

Chap. 144 of the Acts of 1876, whereby the abattoir at Brighton was placed under the charge of this Board, prohibited the business of slaughtering within the city limits

after June 1, 1876, except at the abattoir. Prior to 1876 this Board had made a regulation affecting this business, which was published in the report of last year. The five cases of appeals from the order of the Board under that regulation, and which, at the date of our last annual report, were pending in the Superior Court, are ended, the petitions in each case having been, by agreement of parties, dismissed without costs.

RENDERING ESTABLISHMENTS.

In our last report we mentioned the efforts of the Board to prevent rendering in the city (except in certain places), the regulation made and published, and the notices served on all parties who were then known to be rendering. Two only of the parties so rendering, and served with notice, took the appeal allowed by statute. One of these cases was tried in the Superior Court, before the Chief Justice and a jury, in September last. The verdict of the jury may, by statute, alter the order, or affirm or annul it in full, and, "when accepted, it shall have the authority and effect of an original order from which no appeal had been taken." The verdict in this case annulled the order so far as it prohibited the rendering of fresh tallow, and affirmed it in its prohibition of rendering other refuse animal matter.

And this verdict was accepted. To save the time, trouble, and expense of trial in the other case (as there were nearly one hundred witnesses on the one side and on the other in the former case), we disposed of it in the same manner; some additional guarantees having been given us that the premises should be kept clear, and the business so conducted that there should be no complaint. The other parties (those who did not appeal), we believe, obeyed the order of the Board.

PUBLIC AMBULANCE.

The removal and care of persons injured or falling sick in our streets is a subject which has for a long time engaged our attention, but we have forborne its mention in our reports to you, because we had reason to expect a change ere this, and because the propriety of suggestions from our Board on this matter might be questioned.

We respectfully beg to state that the present method, or total want of method, in securing prompt and proper removal and intelligent aid for this class of helpless persons, is fraught with no little danger to life, and is not in keeping with the charitable institutions of our city. In time of peace, and in our civilized city, to handle broken or dislocated

bones, apoplectic or other diseased persons, with unskilled hands, without professional supervision, is generally inexcusable. To cause such person to walk, be helped, or carried to a police station, there to wait for the promiscuous aid (?) to arrive, — generally unprepared to do more than simply to "order him sent to the hospital," or else painfully subject him to what must all be done over again at the hospital or home, — is, as a rule, an injury to the patient, an unnecessary cost, and it may be a serious waste of time.

To drive such person from one part of the city to another in an open or hard-riding wagon (we have often seen them, face up, in the hot sun), or in any carriage not specially adapted for it, with fracture or disease to be made worse by every jolt or shock, with chances of sudden hemorrhage from wounded vessels, unattended by a skilled nurse or physician, is a practice too palpably wrong to be allowed for another day.

The remedy is very simple, can be quickly applied, and be attended with very small cost, by utilizing the means already on hand. Purchase an ambulance, properly fitted for carrying the sick and wounded; provide it with such medical and surgical means and appliances as experience has shown to be necessary for immediate or temporary use in emergencies; place it at the City Hospital, where there is, or should be, a good horse and harness. There are also at this hospital ten or twelve competent and discreet house physicians and surgeons, whose time is not wholly occupied, and who would be instantly on hand when needed. Connect the City Hospital by telegraph wire with the nearest police station, and it will then have telegraphic communication with all of the stations in the city. When any person is injured, or falls sick in the street, or other place requiring public aid, let him either remain on the spot, or be taken into the *nearest* building, and a telegram sent for the ambulance by the police. This, in most instances, could be done in five or ten minutes. The ambulance, with the house physician or surgeon, as may be indicated by the telegram, could be on hand in a very few minutes more, when the patient would be sure to receive prompt care, and an easy transit to the hospital; where, after treatment, he can pay his bill; or, if a charity patient, the city will have well done her simple duty to a helpless person.

VACCINATION.

Vaccination of children has been encouraged and provided for among the poor, as in former years. The City Physician's office, in the Chardon-street building, is open from 10 to 12

A. M., six days in the week, throughout the year, where, free of expense, children can be taken to be vaccinated, with animal virus, or with carefully selected humanized virus of one or at most two removes. From 2 or 3 to 50 per day avail themselves of this charity, which is performed by Dr. McCollom, assistant to the City Physician.

Several of the public schools have been reviewed by the same officer, and the unvaccinated children attended to and certificate given.

TRAMP.

The tramp, or vagabond, and the treatment he receives, require a passing notice.

During the year ending December 31, 1876, 63,000 lodgings were provided in the fifteen station-houses of our city. These persons are generally very dirty, lazy, and lawless, although some of them are merely poor.

They are permitted to stow themselves away, five or six in a cell, where only one or two can properly find room, until all the cells in these basements are filled with supperless, unclean persons, whose clothing and bodies are frequently covered with vermin. By ten or eleven o'clock in the evening lodgings in these quarters will have been found, through the kindness of the police, for a number sufficient for one to get a fair idea of the condition of the atmosphere to be breathed by all in the building throughout the night. An attempt is made on the part of the police, by scattering deodorants, to keep down the smell; but the very nature of things absolutely forbids anything like success in this direction. Standing in almost any part of the basement, any one unaccustomed to it will find himself unable to bear the smell, which is not as easily described as remembered.

They pass the night in this foul air, get up in the morning, and in their dirty condition saunter off to beg or steal through the day, or to pass on to some other locality; frequently, however, they turn up the next night at some of the police stations in the city, and the same rôle is acted over and over again, until hospital, almshouse, or prison relieves the public for a season. The question arises, cannot something be done, in a public way, to improve this class of miserable, unproductive, filthy, and not unfrequently dangerous persons in our midst?

In the first place, no person should ever be compelled, or allowed, to sleep in these underground, ill-ventilated cells.

It conduces directly to disorder, laziness, depravity, disease, and pauperism. If there is one particle of human instinct or aspiration for decency left in them, it must

surely wane or die in this wretched place, where none but gas-light ever enters to discover the actual conditions.

Should we not provide and maintain for this class of wretched humanity places of reception something like the "Casual Wards" in London, — not for criminals or drunkards, but for those who need merely a night's lodging? — a place where the vagabond can enter, be registered, receive a proper supper if needed, take a bath, and in a clean night-dress retire upon a plain but decent and wholesome bed, situated in a ward where its measured space and ventilation shall be prescribed by a competent body, or by law. Let him rise in the morning, receive his clothes, which have been so thoroughly fumigated that neither infection nor vermin can be left therein to scatter in his travels, partake of a simple yet wholesome breakfast, be ushered into a workroom, where, in some way, he shall perform three hours of faithful labor, and then take his leave.

In this way what do you accomplish? He will have changed in many cases from the wretched, dirty, and disheartened vagabond to a clean, refreshed, and encouraged man, more willing to work, and with strength to do it. The cost of such treatment would be very small, and the amount of good very great. His presence about the streets and elsewhere would be less objectionable, and his appearance in seeking occupation much more favorable.

Intoxication should be sufficient cause to refuse admittance, and a second lodging for the same person should be refused, on the ground of inviting tramps, or encouraging idleness, unless experience shall teach otherwise.

An accurate registration should be made on their admittance, which would serve to identify the tramp afterward, if required.

In this way we make him clean, strengthen, and encourage him to work, if he has any desire.

SCHOOL-HOUSES.

While money has been so lavishly expended in building, heating, and ventilating our public school-houses, rendering them models of architectural beauty and convenience, the sanitary condition of the privies and vaults connected with them seems to have been almost entirely overlooked.

The old-fashioned vaults of a century ago are still in use, and are made to accommodate the several hundred pupils attending each school.

All vaults of this character, either public or private, are invariably a nuisance. They should be abolished, and water-closets substituted wherever the drainage will permit. At

the request of teachers and others, we have made a thorough examination of a large number of these privies, and found them to be extremely offensive, not only to the teachers and scholars, but to the residents in their vicinity. The odors escaping from them pervade the school-rooms, causing nausea, compelling the teachers to close the doors and windows, to exclude the disgusting scent, which, even then, penetrates the rooms, especially when the atmosphere is warm and muggy, and the scholars are most in need of pure air from without.

The state of these privies is such that they cannot be otherwise than a nuisance, detrimental to the health of teachers and scholars.

These privies being under the charge of another department of the City Government, we have called the attention of that department to their condition, and urged upon it the necessity of taking some measures to remove this just cause of complaint.

In their present state these privies are a disgrace to the city, and should not be suffered to remain through another season.

INFANT BOARDING.

With a view of keeping under sanitary inspection all places at which infants are boarded, the following order of the Board was passed, November, 1876:—

OFFICE OF THE BOARD OF HEALTH,
BOSTON, November 30, 1876.

All persons engaged in the business of taking infants to board are hereby notified that the provisions of the following Act will be rigidly enforced.

By direction of the Board of Health.

C. E. DAVIS, JR., *Clerk.*

Extracts from the Statutes. Acts of 1876.

[CHAP. 158.]

AN ACT for the better Protection of Infants.

Be it enacted, etc., as follows:—

SECT. 1. Whoever engages in the business of taking nursing infants, or infants under three years of age, to board, or of entertaining or boarding more than two such infants in the same house at the same time, shall within two days after the reception of each such infant beyond the first two, give written notice to the Board of Health of the city or town where such infant is so to be entertained or boarded, specify the name and age of the child, and the name and place of residence of the party so undertaking its care; and such Board of Health shall have the right to enter and inspect said house and premises while said business is being carried on, and to direct and enforce such sanitary measures respecting such children and premises as it may deem proper.

SECT. 2. Any person violating any of the provisions of this act, or refusing admission to such Board of Health for the purpose mentioned in the preceding section, shall, on conviction thereof, be punished by a fine of not less than fifty, nor more than five hundred dollars.

In accordance with the provisions of this order, three parties reported themselves as engaged in taking babies to board. During the year the names of fifty infants have been recorded as boarding at these three places. There can be no question that many other parties are engaged in the same business, but in such a manner as to escape the notice of the Board. These three places have been inspected from time to time by one of the medical inspectors.

LYING-IN HOSPITALS.

Under the law relating to the licensing of lying-in hospitals by the Mayor and Aldermen, seven petitions have been referred to our Board during the year. We have in all cases carefully considered the suitableness of the hospital and the person petitioning. One has been recommended, and six have not. Those licensed have been frequently visited, to see that nothing in the general conduct or sanitary condition of the hospital is objectionable.

CEMETERIES.

The cemeteries under the charge of this Board contain about thirty-seven and one-half ($37\frac{1}{2}$) acres of land, divided as follows, viz: —

Boston proper, Copp's Hill Cemetery,	88,800 sq. ft.
“ “ King's Chapel “	19,200 “
“ “ Granary “	81,900 “
“ “ Central (Common) Cemetery,	60,200 “
“ “ South	75,500 “
Roxbury District, Eustis St.	“ 34,700 “
“ “ Kearsarge	“ 54,500 “
South Boston District, Hawes	“ 16,800 “
East Boston District, Bennington St.	“ 157,500 “
Charlestown District, Bunker-Hill St.	“ 48,000 “
“ “ Phipps St.	“ 76,740 “
Dorchester District, North	“ 135,036 “
“ “ South	“ 87,120 “
West Roxbury District, Centre St.	“ 39,450 “
“ “ Walter St.	“ 39,216 “
Brighton District, Evergreen	“ 602,230 “
“ “ Market St.	“ 18,000 “
	<hr/>
	1,634,892 “

The amount appropriated for the care and repairs of all the cemeteries above named, except the Evergreen, was \$6,000 00

The expenditures have been as follows :—

Paid for cutting grass and keeping the paths and grounds in order, including flowers, shrubs, etc.,	\$2,709 90	
Paid for repairs, fences, tombs, etc.,	2,131 53	
Paid for care of city morgue and hearse,	172 50	
Balance on hand, unexpended April 30, 1877,	986 07	
	<hr/>	\$6,000 00

The amount appropriated for the care of Evergreen Cemetery was	\$800 00	
On hand, April 30th, 1876,	417 49	
Received from sale and care of lots, graves, etc.,	1,252 00	
	<hr/>	\$2,469 49

The expenditures were as follows :—

Paid for care of cemetery, grading new lots, graves, walks, etc.,	\$2,266 64	
Balance on hand, April 30th, 1877,	202 85	
	<hr/>	\$2,469 49

It has been the aim of the Board to expend as little money as possible upon these grounds, and at the same time keep them in a creditable condition.

The time is fast approaching, however, when a much larger yearly expenditure will be required for repairs on walls, fences, monuments, etc., which are fast going to decay. We believe the time has already arrived when the cemeteries within the limits of the city proper should be closed against further burials, not only as a sanitary measure, but with the view of eventually removing the remains of the bodies which have been buried therein to some more suitable locality in the suburbs.

The following estimate of the value of the lands in the Chapel and Granary grounds is estimated upon the valuation of land in their vicinity :—

Value of Chapel grounds,	\$300,000 00
Value of Granary grounds,	900,000 00
	<hr/>
Total,	\$1,200,000 00

If they could be sold at this valuation, or taken by the city for public use, say for the extension of City Hall or a Court House, the amount would purchase a larger tract of land in some outlying district or neighboring town, put it in proper condition, and still leave a surplus, the income of which would, if properly invested, be more than amply sufficient to keep the grounds perpetually in order.

Sooner or later (it may not be in this or the next generation), the remains of those buried in these cemeteries will be removed, and the ground will be used for other purposes. There can be no better time for such a movement than when some of the descendants of those who were buried therein are living, and can see that the removal is properly accomplished.

INSPECTION OF PROVISIONS.

The inspection of provisions of all kinds has been faithfully conducted by the inspector, John H. Terry, who has filled the office with credit to himself, and fidelity to the city, for the last three years.

This is an important service, and one whose necessity is not likely to be over-estimated. Every resident of our city is likely to be favorably or unfavorably affected, according to the intelligent or unintelligent, faithful or unfaithful service of this officer.

It is his duty to be vigilant and active in all parts of the city, to examine meat, vegetables, fruit, fish, shell-fish, and provisions of all kinds, and to seize and destroy them whenever found to be tainted, diseased, corrupted, or unwholesome. For this purpose he has authority, under statute law, to enter into all buildings or enclosures within the city where animals, meats, fish, vegetables, produce, fruits, or provisions of any kind are kept, stored, or exposed for slaughter or sale.

His seizures are subject to the approval of the Board of Health when an appeal in writing is made by the owner of the property at the time of the seizure.

The report of this officer to the Board of Health for the year ending April 30, 1877, shows the following articles to have been seized and destroyed by him as unfit for human food:—

5,071 lbs. fresh beef.	67 veals.
60 lbs. corned beef.	244 lbs. veal.
75 lbs. beef hearts.	3 saddles.
42 beef livers.	1 leg.
12 ox-tails.	1 lamb.

25½ lbs. mutton.
 458 lbs. fowl and chickens.
 1,088 lbs. turkey.
 150 lbs. mackerel.
 250 herrings.
 150 lbs. fish.
 50 lbs. smelts.
 35 doz. eggs.
 29 bbls. apples.
 32 crates apples.
 8 bushels apples.
 5 crates peaches.
 5 bushels peaches.
 6 crates pears.
 1 bushel pears.
 8 doz. bananas.
 1 bbl. 10 gals. oysters.

10 bbls. turnips.
 6 doz. cantelopes.
 6 bushels pease.
 37 different lots of green
 apples, varying from 2 to 10
 quarts, each destroyed.
 9 persons were adver-
 tised under the statute law.
 6 persons were prose-
 cuted in Court.

Fines amounted to \$165 00
 Costs, \$41 10

Total fines and
 costs, \$206 10

By an act of the Legislature (Chap. 144 of the Acts of 1876) this Board was authorized to appoint an inspector for the abattoir, whose duty it should be to see that the rules and regulations of this Board for the conduct of the business of the association are fully obeyed, and also to see that none but healthy animals are slaughtered.

Authority was given said inspector to enter any building or premises of said association, for the purposes of examination, inspection, and seizures of any meat or animals unfit for human food. His salary was to be fixed by the City Council.

This law went into effect May 17, 1876, and on May 24 following we appointed to this office, without pay, John H. Terry, who made daily visits to the association buildings and premises throughout the year with a fair result.

After a year's experience the Board concluded that the public interest would be better served by placing an inspector permanently at the abattoir, and on April 1, 1877, the same officer, having been relieved from other duties, was ordered to devote his entire time at this place, and the following petition was sent to the City Council: —

OFFICE OF THE BOARD OF HEALTH,
 BOSTON, March 29, 1877.

TO THE HONORABLE THE CITY COUNCIL OF BOSTON: —

Gentlemen, — By an Act of the Legislature of 1876, entitled "An Act to amend an Act to incorporate the Butchers' Slaughtering and Melting Association in Brighton," section 4, chapter 144, the Board of Health is authorized to appoint one or more inspectors to see that the rules and regulations for the conduct of the business of the association

for the time being are fully obeyed by said association and their tenants, and to see that none but healthy animals are slaughtered; the salary or salaries of said inspector or inspectors to be established by the City Council.

This appointment has now become necessary, and the Board of Health is desirous of making the same as soon as the salary to be paid said inspector is determined.

Respectfully submitted,

S. H. DURGIN,
Chairman.

No concurrence has yet been reached in the Board of Aldermen, owing to a question of the need of such officer, although it is confidently expected that they will soon agree upon a salary for this officer.

It should not be inferred from the discussion of this subject that we have in the Brighton Abattoir Association gentlemen who would more willingly put upon the market immature or unwholesome meats than those found elsewhere in the same business. Most of the gentlemen of this association, with whom we have come in business contact, we believe to be honorable men, who would not fraudulently impose unwholesome meats upon the people of our city.

But that there are those who, through avarice or ignorance, do cause or allow sick or immature animals to be slaughtered and prepared for our markets, is not less true. Nor is it strange that they should so strongly oppose the placing of an inspecting officer there to secure the reasonable demands of our people.

There are slaughtered annually at the abattoir about 74,000 cattle, 274,000 sheep, and about 8,000 calves. Statute law prohibits slaughtering within the city limits, except at the abattoir.

By the report of the inspector it appears that he condemned and destroyed at the abattoir during the year ending April 30, 1877, 2,840 lbs. of beef and 2 calves. During the month of April just past, while permanently employed there, he found it necessary to seize and destroy 990 lbs. beef.

It is safe and reasonable to predict that, with the care now used at the abattoir and the vigilance of the inspector now permanently stationed there, very little meat in an unwholesome condition will be likely to leave the premises of the association.

The Regulations, revised and adopted by the Board of Health, in February last, are hereto annexed:—

CITY OF BOSTON.

OFFICE OF THE BOARD OF HEALTH,

BOSTON, Feb. 21, 1877.

In accordance with section 5, chapter 144, of the Acts of 1876, the following regulations have been adopted by this Board for the conduct of the business at the Abattoir of the Butchers' Slaughtering and Melting Association; and strict compliance therewith, both on the part of the Association and of its individual tenants, will be insisted on by the Board.

By order of the Board of Health,

C. E. DAVIS, JR.,
Clerk.

REGULATIONS.

1. Only animals in health shall be slaughtered for food.

Dead or diseased animals, when received in ordinary consignments of live-stock to persons slaughtering on the premises, may be prepared for rendering in the basements, and thence immediately transferred to the rendering-tanks and rendered.

2. No unnecessary pain shall be inflicted on any animal.

An ample supply of food and water must be served to animals at seasonable times.

3. All parts of animals slaughtered on the premises shall at once be put in the places provided for their reception; the offal, tallow, heads, feet, blood, hides, and tripe shall all be dropped through those openings in the floor which are specially designed to receive them. While the killing is in progress, the blood-hole in the trough shall be kept open, and the water-hole closed; and when the slaughtering is finished for the day the water-hole shall be opened and all the other holes closed; and the floor and walls of the slaughter-house shall be thoroughly scraped, washed, and cleaned.

The close-pens, cooling-rooms, loading-sheds, stables, and all other parts of the premises, shall be kept clean and in orderly condition.

4. No parts of animals slaughtered elsewhere shall be brought to the premises, except by special permission in writing of the Board of Health of the City of Boston.

Permission to bring blood or offal (except fresh heads and feet) will not be given in any case.

5. The Corporation shall provide, in the basement, a sufficient number of properly-constructed wagons, to receive the offal, tallow, heads, feet, blood, tripe, and hides. One of said wagons shall be constantly kept under each opening in the floor while killing is going on, and until the slaughter-house floors are cleaned, after the killing.

All parts of the slaughtered animals which are to be rendered, dried, or salted on the premises, shall be so treated without delay.

All hides and skins, tallow or tripe, belonging to any tenant of the Corporation, who desires to have them removed from the premises before being rendered, salted, or cured, shall be so removed at once. In no case will such material be suffered to remain more than twelve hours before removal.

6. The Corporation shall render all tallow produced on the premises by any person hiring or occupying any part thereof, whenever such person shall request it, and shall also render all tallow that is not removed from the premises as provided in the last section of the preceding regulation. And after such rendering, the Corporation shall return to each person his proportionate share of such rendered tallow,

unless some other disposition of the same shall be mutually agreed upon. And all hides and skins not removed as provided for in the last section of the preceding regulation shall be salted by the Corporation and returned to the owners. And the Corporation shall receive for the rendering and salting provided in this regulation, such compensation as shall from time to time be fixed by the directors, subject to the approval of the said Board of Health. But this regulation shall not prevent the Corporation from buying from any tenant his crude tallow, or his hides, skins, and tripe, at such price as may be agreed upon.

7. The Corporation shall at all times keep the basements of the slaughter-houses thoroughly washed and cleaned; and shall provide that no blood, offal, or manure shall at any time enter the sewers.

The rendering-house shall be kept at all times clean and in good order, and none of the gases from the rendering-tanks, driers, or condensers shall be permitted to escape into the open air or into the sewers.

Manure from cattle-pens, close-pens, and stables, and from the stomachs and intestines of animals slaughtered, shall be removed from the premises as often as may be necessary to ensure cleanliness; and all the grounds of the Corporation must be kept in an orderly condition.

8. The Corporation shall render the heads and feet of all animals slaughtered on the premises, and shall pay for each set of heads and feet such price as the directors may fix, from time to time, subject to the approval of the said Board of Health, unless the parties shall agree upon the price.

9. All blood, intestines, and other offal, which are the property of the Corporation, shall be rendered while fresh, and all scrap and blood shall be dried immediately.

10. The Corporation shall furnish the necessary hot and cold water for cleaning the meat and the slaughter-houses, and also water for the stables and stock-yards.

In the use of the machinery and water, the tenant shall exercise all reasonable care to avoid breaking the machinery, wasting the water, and injuring the buildings.

11. All leases shall be executed in the name of the Corporation, and shall contain a condition that the lessees will conform to the foregoing regulations, and to such regulations as shall hereafter be made by the Board of Health of the City of Boston, or by the Corporation with the approval of said Board of Health.

Any person engaged in slaughtering or other business on the premises of said Corporation, who shall violate any of the regulations of said Board, shall be liable to a fine of not less than twenty nor more than five hundred dollars. Chap. 365, Acts of 1870.

ADULTERATIONS.

The adulteration of articles of food and drink has been examined, and the results published by our State and City Boards of Health, from time to time, ever since they were established.

Others have also examined into and published accounts of these iniquitous and fraudulent adulterations.

So patent has this fraud become that scarcely any investigation can be made into even the commonest articles of food

and drink, which does not reveal more or less fraud in the shape of a shameful admixture of some worthless or dirty material, and in many instances there are found the most deadly poisons.

Much money has been spent in this and other cities in the examination of articles and publishing the results, but so far as we can judge very little if any good has resulted therefrom in the way of diminishing the abominable practice.

The statute law concerning this matter deals only with the manufacturer (who adulterates with substances injurious to health), and reads as follows, under Chapter 26 of the General Statutes : —

CHAPTER 166, GENERAL STATUTES.

SECTION 3. Whoever fraudulently adulterates, for the purpose of sale, bread or any other substance intended for food, with any substance injurious to health, shall be punished by imprisonment in the jail, not exceeding one year, or by fine not exceeding three hundred dollars; and the articles so adulterated shall be forfeited, and destroyed under the direction of the court.

SECT. 4. Whoever adulterates, for the purpose of sale, any liquor used or intended for drink with *cocculus indicus*, vitriol, grains of paradise, opium, alum, capsicum, copperas, laurel-water, logwood, Brazil wood, cochineal, sugar of lead, or any other substance which is poisonous or injurious to health, and whoever knowingly sells any such liquor so adulterated, shall be punished by imprisonment in the State prison not exceeding three years; and the articles so adulterated shall be forfeited.

The Board of Health determined to make a new departure and try the means offered by Section 3.

Opportunities were accordingly sought, and 20 specimens of candy were purchased from 17 different manufacturers in the city, who, when selling the candy, stated that it was of their own make, and that they sold no other.

These specimens of candy were taken from the place of purchase to the office of the Board of Health, where they were marked for identification, and then delivered in separate lots into the hands of the chemist. Examination showed that over one-third of these manufacturers used chromate of lead (chrome-yellow) in their colored candies, — a substance well known to be a deadly poison in very small quantities. Several cases have been reported elsewhere where death resulted in from 24 hours to 5 days from innocently eating substances containing only between one-fifth and one-sixth of a grain of chromate of lead.

In 1873 H. B. Hill analyzed for the Massachusetts State Board of Health 77 samples of candy, including both white and colored, and of this number 36 contained chromate of lead; of 40 samples which were colored yellow, orange, or green, 36 contained this active poison.

Chromate of lead is used as a pigment, and gives the candy a light-yellow color, and has the advantage of being cheap.

The report of the chemist on the analysis of 20 samples of candy is herewith given in full: —

HARVARD MEDICAL COLLEGE, CHEMICAL LABORATORY,

BOSTON, May 1, 1877.

CHAIRMAN BOSTON BOARD OF HEALTH: —

Dear Sir, — Below please find my report of the analysis of specimens of candy received from you at various times.

As a rule, only those adulterations which are injurious to health were sought for and noted. In some of the specimens, however, I found a large amount of starch.

No. 1 was a specimen of white peppermints, which, on being dissolved in water, deposited a heavy white amorphous sediment, which was slightly soluble in water. This on analysis proved to be sulphate of calcium (plaster of Paris), and, upon estimating its amount, the peppermints were found to contain a little more than ten per cent. by weight of this substance, which, if taken continuously, is certain to prove very injurious.

No. 2 consisted of mixed red, yellow, and white pieces, which were found to be free from any injurious adulteration. The red was tested for arsenic, which might be present in the aniline color, and for mercury, which would be present if the pigment used were vermilion. The yellow was tested for lead, which would be present if chrome-yellow had been the pigment used. These poisons were not detected.

No. 3, marked "15 cents per lb.," consisted of mixed red, brown, yellow, and white pieces.

The white conversation lozenges contained two and a fourth per cent. of starch. The peppermints were pure.

The yellow pieces, on being treated with water, left an abundant deposit, which consisted of starch granules and yellow amorphous particles. The yellow pigment proved to be chrome-yellow (chromate of lead), but as the amount of yellow candy was so small ($3\frac{1}{2}$ grm.) no quantitative estimation was made.

No. 4 consisted of red and white sticks, yellow, red, and white drops. No injurious adulteration was detected.

No. 5 was a duplicate of No. 3; chromate of lead was detected in the yellow pieces in the proportion of about 3 grains to the pound of candy. These pieces were also largely adulterated with starch.

The lead in the chrome-yellow was converted into the form of the iodide of lead, the characteristic crystals of which I have preserved to exhibit in court.

No. 6 consisted chiefly of large yellow cubical pieces, which mostly dissolved in water, leaving but little sediment. A part of the coloring matter dissolved in water, and a part was insoluble. This latter consisted of chrome-yellow to the extent of about $\frac{1}{4}$ of a grain to the pound of candy.

No. 7 consisted chiefly of white conversation lozenges, which were adulterated largely with starch. There were two yellow ones, one of which contained a considerable amount of chrome-yellow. The other one contained about 1-30 grain of chromate of lead, or about $6\frac{1}{2}$ grains to the pound of yellow candy.

No. 8 consisted chiefly of yellow and red oval pieces and yellow lozenges. There were also some green pieces. The yellow pieces contained about $1\frac{1}{2}$ grains of chrome-yellow to the pound. The green consisted of a mixture of Prussian blue and chrome-yellow.

No. 9 was a mixture of white, yellow, pink, and red pieces. No injurious adulteration was detected.

No. 10 and No. 20 were from the same manufactory. They consisted of mixed white, red, and yellow pieces. No injurious adulteration was detected.

No. 11 consisted of white, yellow, brown, pink, and red pieces. No injurious adulteration detected.

No. 12 consisted of white, red, brown, yellow, and orange pieces. No injurious adulteration. The orange pigment consisted chiefly of oxide of iron.

No. 13 was an imitation of a violin. The strings were made of a yellow color, and other portions of a green and pink color. The yellow was not a poisonous one, although its exact nature was not determined. The green was a mixture of the yellow and Prussian blue.

No. 14 consisted of yellow, red, and white pieces. Nothing injurious was detected.

No. 15 was not examined on account of a lack of time, and because it was not of Boston manufacture.

No. 16 was a mixture of yellow, red, brown, pink, and white pieces. This specimen was quite largely adulterated with starch; but nothing of a poisonous nature was detected.

No. 17 was a yellow, red, and white mixture. No poisonous adulteration detected.

No. 18 consisted of green, yellow, and white pieces, to imitate various kinds of fruit; also red and white almonds and drops. About 1-20 of a grain of chromate of lead was obtained from a single piece. The green color was obtained by mixing the yellow with Prussian blue, which is harmless.

No. 19 was from the same manufactory as No. 7, but bought at a later date. The yellow pieces had a very different color from the yellows in No. 7. The yellow pigment in this specimen did not consist of chrome-yellow.

It will be observed, from the above, that the chromate of lead was the only poisonous substance detected, with the exception of the gypsum in No. 1. This substance, like other lead compounds, is so poisonous, even in the most minute doses, that its use in coloring articles intended for food should be prohibited. Fatal cases of acute poisoning in children have been reported, and its power to produce chronic lead-poisoning is, of course, as great as that of any lead compound. As an instance of this power, it may be well to mention the following case in which lead colic and other symptoms of lead-poisoning appeared among the inhabitants of a village in England. These symptoms were traced to the river water, which was used by the inhabitants for drinking and cooking purposes, and which upon analysis was found to contain only one part of carbonate of lead in 500,000 parts of water, this lead being derived from a lead mine which had been recently opened on the bank of the river a short distance above the village. Granting that a person drank of this water one gallon daily, the amount of lead introduced into the system could not be more than three quarters of a grain per week.

Very respectfully,

Your obedient servant,

EDWARD S. WOOD.

Those cases where the poisonous substance has been found in the candy have been prepared for court, and we are now awaiting its action.

SMALL-POX.

From May 1 to Dec. 27, 1876, no case of small-pox was known to us in the city. From Dec. 27, 1876, to April 30, 1877, five cases were reported, from the following places: 33 Decatur street, C. D.; 49 Richmond street; 65 Eastern avenue; — Canal street, C. D.; and Whitney street, in the Highlands.

Six cases in all, — three males and three females.

One died, and five recovered.

Since Nov. 27, 1875, when the Marcella-street Hospital was surrendered to the city, we have been without a hospital on the main land to which we could send such patients, and we have been subjected to the embarrassment of sending them to the island, when they were able and the weather would permit, and they could not be sufficiently isolated at home.

In November, 1875, an order was passed by the City Council, authorizing the Board of Health to purchase, with the approval of His Honor the Mayor, a site with buildings for a small-pox hospital.

In response to the above, the Board of Health has been diligent in its search for some location where the least objection could be made, and the best hospital requirements found. It has proved to be anything but a pleasant undertaking, or one of easy accomplishment, to secure any place where the small-pox patient — the most pitiable, dejected, and forlorn — can be taken without subjecting the Board of Health to the severest criticism of land-owners in the vicinity.

There is no spot on the main land which does not lie in contact with some other; and so long as this condition remains we shall find objections in locating a small-pox hospital. We have seen and favorably considered several sites, but failed to secure them. It must be within the limits of the city, and should be so located as to admit of good drainage, and, in all respects, be surrounded by the best sanitary conditions.

We have now in view one which we believe will be approved by the Mayor, can be purchased considerably within the appropriation, and is so isolated as to render danger to neighbors or street travel altogether out of the question.

But, above all, it is a high, dry, and delightful spot, where all that can be desired, in a sanitary sense, can be obtained, and the unfortunate victim to this dreaded disease placed under the most favorable conditions.

Negotiations are now in progress which we believe will

put us in possession of these accommodations, when, upon notification of a case of small-pox, we can at once secure its removal to hospital without reference to the weather, renovate the premises left, and, in all respects, as promptly secure the safety of the patient and provide against the spread of the disease, as before the surrender of the Marcella-street Hospital.

MORTALITY STATISTICS FOR 1876.

The work of recording various essential facts concerning the deaths occurring in the city has been continued. We cannot help regarding this as a very important department of sanitary administration, because the registration of deaths affords the best practicable guide for our work. It has been repeatedly demonstrated that early and direct information concerning deaths has been the means of disclosing conditions inimical to life and health, and of initiating effective measures for abating or removing those conditions.

There are certain diseases included among the recorded causes of death, whose development and progress it is the especial duty of this Board to oppose. These diseases are termed by some, the "Zymotic" group; by others, the "filth diseases;" and by others, the "preventable" diseases. Then, again, facts with regard to the local distribution of such diseases as prove fatal are of paramount consequence in the absence of a systematic registration of diseases in advance of their termination, fatal or otherwise. The influence of age and season on mortality-rates is likewise important. We shall consider these various relations, so far as the mortality-registration for the year 1876 has afforded us material for so doing.

During the year ending Dec. 31, 1876, there were 8,253 deaths recorded in this office.*

Assuming that the annual rate of increase in the population of the city is the same in the present quinquennial census period, 1875-1880, as in the five years previous to the last census, 1870-1875 (and any other estimate of our population is necessarily speculative and based at the best upon shrewd guesses), the people of Boston, in the year 1876, numbered 352,758.

The mean rate of mortality per 1,000 of the living in 1876

* In all the following remarks upon the vital statistics of the city for 1876, the record of still-births is not taken into account.

was, therefore, 23.39. That is to say, to every 100,000 persons living, there were 2,339 who died.*

It is apparent that the mortality must have been unequally distributed. It does not require special acumen to determine that some parts of Boston are more favorable to longevity and vigorous health than others. Hence it will be instructive to make an analysis of one year's mortality record, with a view to ascertain the relative salubrity of different parts of our municipal territory.

For the purpose of comparing the various sections of the city upon a basis of comparison more distinctive than the ward-lines afford, the city's area has been divided into nineteen sanitary districts, each having tolerably well-defined characters as to population, soil, and quality of inhabitants. These districts are as follows : —

I. East Boston, above Porter street : mostly high ground, well drained ; inhabited by a prosperous people of the middle class. Population, 14,357.

II. East Boston, below Porter street : low ground ; in some parts densely inhabited, with many blind alleys, tenement houses and wet cellars ; foreign-born predominate. Population, 15,909.

III. Charlestown : a range of hills with territory sloping to water, north and south ; generally well drained ; inhabitants nearly equally divided between native-born and foreign-born. Population, 34,606.

IV. The "North End," east of Salem street and north of Prince street : densely inhabited with an improvident population crowded in tenement houses. Population, 18,202.

V. The "Old Mill Pond," a section of which Haymarket Square is the centre : filled territory and poorly drained ; inhabited by lower classes in insanitary dwellings. Population, 12,840.

VI. Leverett-street District : inhabited by lower and middle classes, upon poorly drained soil, some of it filled land ; not specially overcrowded. Population, 12,488.

VII. Beacon Hill : high land, good drainage, excellent class of dwellings and inhabitants, except in a limited area upon the northern slope. Population, 23,741.

VIII. The "Back Bay," north and south of Commonwealth avenue, and west of Arlington street : exclusively "made

* The following statement of mortality-rates for 1876, gathered from reliable sources, will afford an opportunity of comparing Boston with other cities : —

London	22.2
New York	27.46
Philadelphia	22.88
Brooklyn	24.31
Chicago	20.41

land," but inhabited by an excellent class, in modern expensive dwellings. Population, 14,287.

IX. The "South Cove": in all respects, as regards soil, drainage, dwellings, and people, an unhealthy district. Population, 15,310.

X. South Boston, below E street: inhabited densely by mechanics and laborers, largely foreign-born; drainage fair. Population, 22,365.

XI. Dorchester Heights and City Point: high, natural territory, overlooking the harbor and exposed to the free action of uncontaminated winds; soil sandy and well drained; inhabitants thrifty; not crowded. Population, 19,296.

XII. Washington Village: low and in parts "made land;" people of the middle and lower classes; drainage fair. Population, 14,216.

XIII. The territory between the Boston and Albany railroad and Milford street, embracing the recently raised Suffolk-street section and the district in which are Seneca street, Rochester street, and Oswego street: mostly "made land;" occupied by a mixed Irish and German population; drainage good in the newer territory, very bad in the other. Population, 15,098.

XIV. "Boston Neck," between Milford and Camden streets, and east of Warren and Columbus avenues: thickly settled with thrifty inhabitants, in good dwellings; territory too low for good drainage in some parts. Population, 27,621.

XV. The Ruggles-street District: low, poorly filled territory, badly drained, and inhabited by an unthrifty class, mostly foreign-born, and indifferent to measures for promoting health. Population, 31,713.

XVI. The territory upon and around Mount Pleasant and Mount Warren, in Roxbury: high, well drained; inhabited by an intelligent and prosperous people. Population, 27,727.

XVII. West Roxbury: sparsely settled, outlying territory, approaching a rural character. Population, 12,699.

XVIII. Dorchester: much like the last. In many parts the water service has prematurely gone before the sewers. Population, 13,899.

XIX. Brighton: rural in character. Formerly objectionable on account of its numerous slaughter-houses, but now in most respects desirable for residences. Population, 6,387.

The population of these districts has been estimated upon the basis of the census of 1875; it is presumed, as in the case of the entire city, that the rate of increase has continued

uniformly in these subdivisions. At all events, it is believed that the estimates here given are a close approximation to exactness.

The following table, showing the mortality rates for 1876 in these several districts, presents many suggestive contrasts. The computations do not include the deaths that occurred in large hospitals and in public institutions, although these latter are given in the mortality of the city at large. To add to the deaths legitimately assignable to the district in which the City Hospital happens to be placed, the deaths that occurred in that large charity, or to give Dorchester the credit of the mortality occurring in St. Mary's Infant Asylum, would seriously impair the conclusions to be derived from such an analysis as we propose, and modify the contrasts to be observed in the mortality-rates of the various districts.

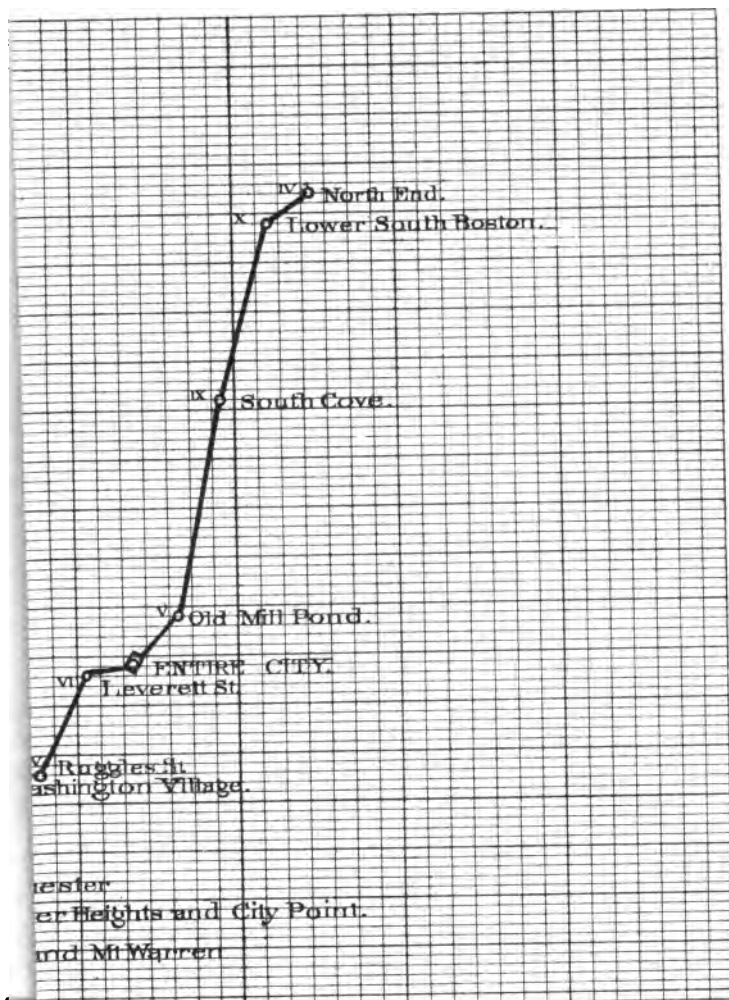
DISTRICTS.	Estimated Population, July, 1876.	Deaths. (Deaths in Institutions excepted.)	Death-rate per 1,000 living.
I. Upper East Boston	14,857	255	17.7
II. Lower East Boston	15,909	815	19.8
III. Charlestown	34,606	693	20.0
IV. North End	18,202	514	28.2
V. Old Mill Pond	12,840	307	23.9
VI. Leverett Street	12,488	291	23.3
VII. Beacon Hill	23,741	450	18.9
VIII. Back Bay	14,287	201	14.1
IX. South Cove	15,310	399	26.1
X. Lower South Boston	22,365	626	27.9
XI. Dorchester Heights and City Point .	19,296	403	20.9
XII. Washington Village	14,216	317	22.3
XIII. Chapman and Rochester Streets .	15,098	293	19.4
XIV. Boston Neck	27,621	450	16.3
XV. Ruggles Street	31,713	707	22.3
XVI. Mounts Pleasant and Warren . . .	27,727	569	20.5
XVII. West Roxbury	12,699	224	17.6
XVIII. Dorchester	13,890	294	21.2
XIX. Brighton	6,387	101	15.8
Entire City	352,758	8,253	23.4

The comparison which the table affords is made more striking by means of the chart. This shows, in the tracing

at the left, the death-rates of the various districts in their numerical order, and gives an idea of the different degrees of wholesomeness in sections immediately adjacent; in the tracing on the right the ascending scale of the comparative rates is exhibited, beginning with the lowest, 14.1, that of the Back-Bay District, and ending with the highest, 28.2, at the North End. It is to be remarked of the district on either side of Commonwealth avenue that the following factors are to be considered among the determining elements of its low death-rate: (1.) The people living there are wholly of the prosperous class, intelligent, solicitous of the health of their families, able to take the best measures for the care of the sick and to prevent the occurrence of illness; (2.) There is a comparatively small proportion of infants and children in the population here; (3.) Servants, who comprise a considerable part of the population, go to their former homes or to hospitals when they are taken sick, and thus, while counting to add to the number of the living in one section, in the event of their death increase the death-rate in another section; (4.) There is an annual migration of many of the people, during the sickly midsummer season, from their city residences to the country. But, admitting all these modifying conditions, we still are of the belief that due allowance for them would not alter the place which this section of the city has in the comparative scale of mortality rates for 1876.

It is evident, moreover, that besides local characters as regards filth, there are in the districts showing a high death-rate other conditions in operation in marked contrast with those pertaining to districts with a low death-rate. The people living at the North End, in the lower section of South Boston, and around the Old Colony railroad station, are, in general, of the impoverished, ignorant, unthrifty class, careless of moral and physical health, overcrowded in tenement houses, and having no special solicitude concerning public or personal hygiene. There is a superabundance of the infant element in the population. Many of the servants and other employes who contribute to the living population of more wholesome and favored districts are drawn from these sections, whither they return in time of sickness, and whence they are buried in case of death.

It is the progressive work of education and of philanthropy, as well as sanitary administration, to make the upper extremity of this ascending scale of local mortality rates approach, from year to year, nearer and nearer to the lower point; to make such death-rates as 26 to 28 to the 1,000 the rare exception; to modify social, territorial, and intellectual conditions, so that the general city death-rate shall be determined, not by a few districts whose rate of



BOARD OF HEALTH.



mortality is greatly in excess of the average, but by many districts presenting an approximation to uniformity. It is not to be expected that Beacon Hill and the South Cove will ever become identical in point of healthfulness; but it is to be considered as practicable that the contrast between the rates at which the people of the two sections die shall be greatly lessened.

Seasons. — The next table gives the mortality in each month of the year 1876, with the percentage of the whole mortality for each month, and a computation of the annual deaths to each 1,000 of the living in each month. Similar statistics are given also for the four quarters of the year.

Deaths at Different Seasons, with Percentages and Rates.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	The year.
Numbers	807	714	727	680	687	541	871	856	647	613	541	669	8,253
Percentages	9.79	8.65	8.81	8.24	7.11	6.55	10.55	10.37	7.84	7.43	6.55	8.11	100.
An. death-rate per 1,000	27.4	24.3	24.7	23.1	19.9	18.4	29.6	29.1	22.0	20.9	18.4	22.8	23.4
Numbers	2,248			1,808			2,374			1,823			8,253
Percentages	27.24			21.91			28.76			22.09			100.
An. death-rate per 1,000	25.5			20.5			26.9			20.6			23.4

Perhaps the most instructive feature of this table is in the numbers giving the death-rate. These show in each month and in each quarter what the death-rate for the entire year would be if the deaths in each month and quarter were multiplied by twelve and four respectively. Thus, if there had been in each of the eleven months after January 807 deaths, the death-rate for the year would have been 27.4 per 1,000, and so on. We are thus enabled to see that May, June, and November were the seasons of least mortality, and that July and August, as in all former years and all other cities, in America at least, give the maximum death-rates.

It will be interesting in this connection to see if there is any relation directly traceable between the figures given in the foregoing table and the weather observations, as recorded at the Signal Office at this station. The following table gives the weekly averages of meteorological conditions, with the total number of deaths registered each week : —

Weekly Means of Temperature, Humidity, Velocity of Wind and Rainfall during the Year 1876, as observed at the Signal Office, Boston, with the Total Number of Deaths recorded in each Week.

WEEK ENDING.		TEMPERATURE.			HUMIDITY. (SATURATION BE- ING 100.)			Wind. Miles Travelled.	Rainfall. (In inches.)	Deaths Registered.
		Mean.	Max.	Min.	Mean.	Max.	Min.			
January	1	32.4	64.	9.	73.3	100.	48.	2,007	0.17	172
	15	24.7	55.	5.	67.9	100.	43.	2,325	0.40	179
	22	35.4	58.	13.	78.0	100.	44.	2,367	0.47	176
	29	29.1	51.	9.	81.4	100.	46.	1,751	0.81	218
February	5	19.0	39.	. . .	72.3	100.	46.	2,167	0.87	177
	12	37.0	52.	4.	79.9	100.	33.	1,717	0.85	177
	19	33.1	56.	16.	75.6	100.	39.	2,595	2.47	179
	26	19.6	40.	-6.5	66.7	100.	47.	2,676	0.09	152
March	4	25.1	43.	12.	78.3	100.	39.	1,667	0.28	191
	11	40.1	68.	23.	78.3	100.	43.	2,090	0.07	164
	18	26.1	38.	7.	75.7	100.	48.	2,560	0.57	171
	25	30.1	53.	5.	71.1	100.	34.	2,499	3.94	149
April	1	39.3	61.	29.	67.1	100.	39.	2,326	2.61	158
	8	37.4	57.	28.	70.4	100.	29.	2,540	2.78	145
	15	47.6	76.	24.	58.8	100.	27.	2,032	. . .	193
	22	45.7	62.	33.	64.1	100.	44.	1,947	0.21	164
May	29	43.1	61.	34.5	66.5	100.	18.	1,688	0.17	143
	6	45.1	61.	33.5	73.8	100.	34.	1,852	0.34	148
	13	50.6	80.	42.	82.2	100.	39.	1,241	1.21	116
	20	54.4	71.	40.	56.3	100.	27.	1,454	0.32	149
June	27	60.3	85.	40.5	60.2	90.	24.	1,684	0.92	133
	3	59.	86.	42.5	64.7	100.	35.	1,569	0.16	123
	10	63.4	86.	48.5	76.8	100.	42.	1,499	0.46	121
	17	66.2	89.	55.	82.7	100.	46.	1,331	0.30	111
July	24	71.6	88.	56.	68.2	100.	40.	1,841	0.12	123
	1	74.9	90.	63.	64.0	90.	32.	1,350	0.82	150
	8	77.8	93.	65.	63.0	86.	37.	1,871	0.55	158
	15	74.9	96.	62.	75.8	100.	41.	1,075	0.72	202
August	22	76.1	92.	62.	59.4	100.	27.	1,740	0.06	242
	29	66.7	83.	52.	69.2	100.	33.	1,512	2.13	198
	5	66.4	83.	56.	76.7	100.	55.	1,207	2.40	193
	12	75.6	95.5	64.	66.9	90.	41.	1,155	. . .	216
	19	69.4	87.	61.5	82.8	100.	52.	1,288	1.05	197

Weekly Means of Temperature, etc. — Continued.

WEEK ENDING.		TEMPERATURE.			HUMIDITY. (SATURATION BE- ING 100.			Wind. Miles Traveled.	Rainfall. (In inches.)	Deaths Registered.
		Mean.	Max.	Min.	Mean.	Max.	Min.			
August	26	65.9	84.	50.	59.9	100.	27.	1,909	0.18	182
September	2	68.5	91.	53.	54.1	90.	28.	1,452	0.06	179
	9	60.2	80.	47.	64.8	100.	27.	1,698	0.33	149
	16	60.2	77.	48.	63.2	98.	35.	1,443	. . .	140
	23	56.4	69.	47.	58.	100.	64.	1,861	2.46	161
	30	55.2	74.	44.5	75.4	100.	35.	1,872	0.99	138
October	7	53.5	70.	42.	63.9	95.	40.	1,660	0.74	141
	14	48.4	64.	31.	55.1	91.	27.	1,809	. . .	154
	21	43.5	61.	30.	69.3	100.	40.	1,876	0.24	147
	28	48.5	66.	29.	71.9	100.	35.	1,339	0.68	116
November	4	48.4	75.	26.	62.8	100.	26.	1,605	0.10	133
	11	44.3	52.	31.	56.2	100.	37.	1,625	3.96	135
	18	40.7	52.	29.	75.3	100.	56.	1,374	0.57	111
	25	38.	45.	31.	81.	100.	39.	2,598	6.37	122
December	2	26.8	43.	4.5	66.8	100.	37.	1,293	0.03	142
	9	30.2	46.	12.	67.7	100.	27.	1,518	0.15	143
	16	23.7	48.	-1.	69.	100.	44.	2,200	0.37	142
	23	14.2	33.	-4.	80.8	100.	44.	1,581	2.00	163
	30	22.8	40.	5.	77.2	100.	59.	1,817	1.14	167

It is manifest that any influence which the weather may exert on the public health does not impress itself so immediately on the death-rate as on the sickness-rate. If we had a sickness registration we could undoubtedly define a direct coincidence between unusual meteorological conditions and unusual sickness. But the fatal termination of illness is frequently postponed till long after the origin of the disease, so that we must judge with caution concerning the relation of extreme weather to death-rate undulations. Take the case of the summer diarrhoea of infants, cholera infantum as it is commonly called: a hot week in July prostrates scores of children with sickness from this cause; but, of those who die, some will have survived their attack a few hours only; others, a few days; others still, more tenacious of life, will have endured their progressive decline during many weeks, their death occurring long after the hot term has ended. It

is true that unseasonable or extreme weather often has an immediate and tangible influence on the death-rate, by hurrying from the world those who are least able to withstand sudden or great changes; the infirm, the very young, and patients suffering with wasting maladies, are thus taken off. But an examination of the above table will discover many examples of the fact that fluctuations in death-rates do not correspond with marked changes in the weather. In the first week in February, when the mean temperature was as low as 19° Fahr., the lowest point in the week being 0, the deaths numbered 177; while three weeks later, the mean temperature being about the same (19.6°), and the minimum being 6.5° below zero, the force of the wind meanwhile being unusual, the deaths declined to 152, instead of increasing. On the contrary, in January, with the mean temperature at 29° , ten degrees higher than that just quoted, and with a dry and still air, favorable, one would suppose, to public health, the deaths numbered 218. So again, in hot weather, the maximum weekly death-rate was not reached till a full month after the memorable hot season set in, and in a week when the mean temperature was the highest of the year (77.8°) the deaths numbered nearly a hundred less than they did a fortnight later, when the maximum weekly mortality of the year was reached. No doubt, however, the effects of that hot month were distributed all along the subsequent weeks of the entire year. The closest approach to an absolute coincidence of high death-rate and unfavorable weather was in the second week of August, when, with a maximum temperature of 95.5° , a minimum of 64° and a mean of 75.6° , nine degrees higher than that of the previous week, the air being dry and still, the deaths rose in number from 193 to 216.

Age.—The following table will show upon what period of life the mortality of 1876 in Boston bore most heavily. We find that more than a quarter of the deaths were those of infants under a year old; and that more than two-fifths were deaths of young children under five. We thus see again illustrated, what has been observed so many times, that infancy and childhood furnish an excessive proportion of the mortality data of cities.

In the whole State of Massachusetts, in 1875, the percentage of deaths of infants under a year old, when compared with deaths at all ages, was 22.05; and the percentage during the nine years from 1866 to 1874 was 22.11. The percentage of deaths of children under five years old, for the above period, in Massachusetts, were respectively

Rate of mortality for the city is large

36.76 and 35.95. It will be observed that the City of Boston suffered in 1876 a mortality among infants considerably in excess of these figures.

In New York city, the deaths of infants under one year old comprised, last year (1876), 28.03 per cent. of all the deaths; the deaths of children under five were 48.74 per cent. of the entire mortality.

This comparison of percentages is the only reliable method at present available for showing the excess of infant mortality. If we had the relatively accurate data of population in 1876 that were in our possession in 1875, mortality-rates at different ages and at different groups of ages could be calculated; and these would show much more acceptably than the present method, the contrasts to which we have referred. If we estimate that the living children under five bore to the entire population the same ratio per cent. in 1876 that they did in 1875 (the census year), there were 38,080 children among whom occurred 3,560 deaths; these estimated and approximate data give a mortality-rate per 1,000 of 93.49, — a rate less than that for the year ending April 30, 1876 (94.84), but much in excess of the rate for the entire State in 1875 (73.96). When we compare these infant mortality-rates with the rates of mortality at all ages, the contrast is most startling. This truly Herodian destruction of young lives is one of the most serious subjects which urban sanitary authorities are called upon to consider.

It should be explained here that included in the 3,560 deaths of infants in this city in 1876 are 149 deaths which occurred among the inmates of Saint Mary's Infant Asylum, in Dorchester. This institution gives the following statistics of its work during the year:—

Number of children remaining in the Asylum Jan. 1,	
1876	55
Number admitted during the year ending Dec. 31,	
1876	268
Total	323
Number discharged during the year	116
Number died	149
Number remaining Dec. 31, 1876	58
Total	323

These facts appear to invite adverse criticism of the management of this asylum. Such a mortality, amounting to a rate of 461 per 1,000 (nearly one half of all the inmates, and twenty times the rate of mortality for the city at large

at all ages), not only suggests that some most unwholesome and, as we believe, not altogether unpreventable conditions are at work in an institution whose natural advantages of location are exceptional, but actually affects the general mortality-rate among infants in the city as a whole, and by so much helps to give Boston a bad name. We cannot help feeling that if the authorities of Saint Mary's Infant Asylum would supplement the charitable purposes of the founders of their trust, and apply rigid hygienic regulations concerning the overcrowding of sleeping-rooms, the preparation of food, and the preservation of cleanliness, they would find their vital statistics less open to unfavorable comment.

Deaths at Different Ages, with Percentages (Deaths at Ages not Specified being omitted).

	Under 1 year.	1 to 2.	2 to 5.	Under 5 years.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Over 80.	All ages.
Numbers .	2,069	656	835	3,560	456	140	219	781	697	634	507	532	429	290	8,245
Percentage	25.09	7.96	10.13	43.18	5.53	1.69	2.66	9.48	8.45	7.69	6.15	6.45	5.20	3.52	100.

Causes. — Statistics of the causes of mortality are, in theory, the most important element among the data gathered by registration; but, in practice, they are of all parts of the work the most unsatisfactory and the most exposed to error. Diseases are often obscure and do not betray their true nature by unequivocally distinctive signs. Physicians are not less liable than other men to err in observation and in description. Medical opinion has not yet become unanimous about the pathology and nomenclature of certain diseased conditions, and thus discrepancies arise. But before all other obstacles to accuracy, two factors must be placed: on the one hand, there is a certain indifference or carelessness among many physicians who seem to have small regard for the act of certifying causes of death, or for the manner in which the act is performed; on the other hand, we have, through the necessities imposed by the registration law, and by a singular trait in the popular mind whereby in many cases medical advice is deemed trustworthy in the inverse ratio of the intelligence and education of the person who gives it, a considerable amount of certifying by individuals who have no valid claim to the title of "physician," who are deficient in the rudiments of medical training, and whose certificates cannot for a moment be regarded as worthy of record on the score of reliability. Every day affords illustrations of these sources of inaccuracy in the form of death-certificates carelessly

made, inexact in form, unintelligible in matter, with astounding orthography, and showing remarkably slight evidence of appreciation of the true nature and useful purpose of the paper.

The remedy for this is perpetual vigilance in examining the returns, a strict scrutiny in discovering all probable and positive points of error, and in verifying and correcting the certificates before they are permitted to go on record. A radical remedy would lie in the absolute rejection of all certificates signed by persons who are known to be disqualified, through ignorance, to give an accurate medical opinion. But before the adoption of such a course, the systematic supervision of all the returns, and immediate amendment or verification of such as are doubtful, constitute the best available methods.

This system of managing the original certificates has been rigidly carried out during the year. By correspondence, special inspection, and otherwise, errors have been corrected, obscure points have been made plain, doubtful or inaccurate certificates have given place to revised and correct ones. The amount of work of this kind has been considerable, but the fruit of it has been commensurate and satisfactory.

Of the 8,253 deaths from all causes, 8,188 were presented for record, with their causes specified, with more or less acceptable definiteness.

These 8,188 causes of death were distributed as follows : —

	Deaths.	Percentage.	*Death-rate, per 1,000.
Zymotic	2,521	30.8	7.20
Constitutional	2,042	24.9	5.83
Local	2,556	31.2	7.30
Developmental	717	8.8	2.05
Violent	352	4.3	1.01
Total	8,188	100.0	23.39

The death-rate from zymotic diseases — 7.2 per 1,000 — is in excess of the healthy standard for cities; but it is not in excess of the rate in some other cities. New York, for example, had a rate of mortality in 1876, from these causes, of 9.01 per 1,000. The group of zymotic diseases contains the class of disorders which sanitarians have described as preventable, and as generated and fostered by filth — the

* Corrected for unspecified causes of death.

miasmatic and infectious diseases, such as typhoid fever, diphtheria, scarlet fever, and cholera infantum. A low death-rate from the diseases of this class is regarded by health authorities as indicative of a satisfactory attention to practical sanitation in the community in which such a death-rate obtains. Nevertheless, it must be remembered that this indication may be greatly modified by the temporary prevalence, as well as by the relative fatality, of certain of the contagious group. Thus, in the same year, scarlet fever and diphtheria may prevail coincidently, and be also exceptionally fatal. These accidental factors affecting the death-rate should be taken into the account, and, when comparisons are made, the standard should be the mean zymotic death-rate of a long series of years. It should be noticed that a high death-rate from zymotic diseases in any year means that the community is "filthy," or that fatal infectious diseases are prevailing temporarily; or, what is most probable, that both conditions co-exist.*

The death-rate from local diseases (of which pneumonia and bronchitis are examples) was almost identical in 1876 with that from zymotic diseases.

Proceeding now to analyze in greater detail the various causes of death in Boston in 1876, we shall see in what relation different diseases and groups of diseases stood to locality, ages of the decedents, and season.

The following table answers the question, *What were the chief causes of death in different sections of the city?*

The table shows the death-rate per 10,000 of the estimated living population, in each of the nineteen health districts, from the five most destructive causes of deaths; the deaths occurring in public institutions being omitted. Thus, a person residing in West Roxbury may learn that, in 1876, diphtheria and croup together caused more deaths than any one of the other diseases; but the rate per 10,000 (26) was less than that from the same diseases in other sections (East Boston, South Cove, Charlestown), where they held the *second* place. So, again, in the Commonwealth-avenue District consumption heads the list; but the most destructive cause of death here was less fatal than some other diseases which occupy the *fifth* place in the series elsewhere; thus pneumonia, the *fifth* in the South Cove District, exceeded the consumption death-rate in the Back Bay District. Then, too, let the rate from consumption here (16.8) be compared with the consumption death-rate (56.1) of the Leverett-street District. We need not multiply the interesting comparisons which this table affords the opportunity to make.

* It is gratifying to remark here that small-pox caused only three deaths in the city in 1876.

Table showing the Five most Destructive Causes of Death in different Sections of Boston in 1876. Death-rates in 10,000.

	1	2	3	4	5
I. Upper East Boston	Diphtheria and Croup, 26.5	Consumption, 21.6	Brain Diseases, 16.0	Diarrheal Diseases, 13.9	Pneumonia, 13.2
II. Lower East Boston	Consumption, 27.0	Diphtheria and Croup, 26.4	Brain Diseases, 16.3	Diarrheal Diseases, 16.3	Violence, 15.1
III. Charlestown	Consumption, 36.1	Diphtheria and Croup, 23.3	Brain Diseases, 18.5	Pneumonia, 14.4	Diarrheal Diseases, 10.9
IV. North End	Consumption, 47.8	Diarrheal Diseases, 31.3	Brain Diseases, 23.5	Pneumonia, 19.8	Violence, 15.4
V. Old Mill-pond	Consumption, 31.9	Brain Diseases, 27.3	Pneumonia, 25.7	Diarrheal Diseases, 18.7	Heart Diseases, 16.3
VI. Leverett street	Consumption, 56.1	Diarrheal Diseases, 21.6	Brain Diseases, 20.0	Heart Diseases, 16.0	Pneumonia, 12.0
VII. Beacon Hill	Consumption, 30.3	Diarrheal Diseases, 20.2	Pneumonia, 15.6	Brain Diseases, 15.2	Diphtheria and Croup, 13.9
VIII. Back Bay	Consumption, 16.8	Diphtheria and Croup, 16.8	Pneumonia, 15.4	Diarrheal Diseases, 12.6	Heart Diseases, 9.8
IX. South Cove	Consumption, 43.1	Diphtheria and Croup, 29.4	Diarrheal Diseases, 25.5	Brain Diseases, 24.2	Pneumonia, 17.6
X. Lower South Boston	Consumption, 46.5	Diarrheal Diseases, 33.9	Diphtheria and Croup, 21.9	Scarlet Fever, 21.5	Brain Diseases, 17.4
XI. City Point and Dor. Heights	Diarrheal Diseases, 29.5	Consumption, 29.0	Diphtheria and Croup, 21.7	Brain Diseases, 19.2	Scarlet Fever, 16.1
XII. Washington Village	Consumption, 31.7	Diphtheria and Croup, 23.8	Scarlet Fever, 26.7	Brain Diseases, 22.5	Diarrheal Diseases, 16.9
XIII. Albany R. R. to Milford st.	Consumption, 25.2	Diarrheal Diseases, 21.2	Diphtheria and Croup, 21.2	Pneumonia, 19.3	Brain Diseases, 13.2
XIV. Boston Neck	Consumption, 26.1	Brain Diseases, 18.1	Pneumonia, 11.9	Heart Diseases, 10.8	Diphtheria and Croup, 10.8
XV. Ruggles street	Consumption, 27.7	Diarrheal Diseases, 26.2	Diphtheria and Croup, 25.9	Scarlet Fever, 18.09	Pneumonia, 16.7
XVI. Mt. Pleasant and Mt. Warren	Consumption, 25.2	Brain Diseases, 22.0	Diphtheria and Croup, 20.2	Diarrheal Diseases, 17.7	Scarlet Fever, 17.3
XVII. West Roxbury	Diphtheria and Croup, 26.0	Consumption, 10.6	Brain Diseases, 13.9	Pneumonia, 14.9	Scarlet Fever, 11.8
XVIII. Dorchester	Consumption, 30.2	Brain Diseases, 19.4	Diphtheria and Croup, 17.9	Scarlet Fever, 16.5	Diarrheal Diseases, 16.5
XIX. Brighton	Consumption, 32.9	Scarlet Fever, 18.8	Diarrheal Diseases, 12.5	Pneumonia, 12.5	Diphtheria and Croup, 10.9

The next table answers the question : *In what parts of the city were the principal causes of death most fatal in 1876 ?*

The table may be read as follows : In 1876, scarlet fever was most fatal in the Twelfth District of Boston (Washington Village), the deaths from this cause in that district having been at the rate of 26.7 to every 10,000 people at all ages ; it was least fatal in the Fifth District, the rate there having been 7 per 10,000.

We see at a glance how the various parts of Boston stood in 1876 with relation to each other in the matter of prevalent destructive diseases. It requires little study to find many suggestive contrasts in this exhibit.

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Rate.

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II

FATAL IN 1876. DEATH-RATES PER 10,000.

13.		14.		15.		16.		17.		18.		19.		ENTIRE CITY.	
	Rate.	District.	Rate.	District.	Rate.	District.	Rate.	District.	Rate.	District.	Rate.	District.	Rate.	Numbers.	Rates.
	8.8	VIII	8.4	XIV	8.3	VII	8.0	IX	7.8	III	7.5	V	7.0	457	12.9
I	16.8	VII	13.9	VI	12.8	V	12.4	XIX	10.9	XIV	10.8	IV	10.4	735	20.8
	2.9	XVIII	2.9	XI	2.6	VI	2.4	XII	2.1	I	2.1	XIII	1.3	149	4.2
	16.3	I	13.9	VIII	12.6	XIX	12.5	XVII	11.8	III	10.9	XIV	10.5	732	20.7
II	53.3	VI	48.0	XIX	46.9	VII	46.8	V	44.3	VIII	42.0	XIV	34.7	2,138	60.6
	27.0	XIV	26.1	XIII	25.2	XVI	25.2	I	21.6	XVII	19.7	VIII	16.8	1,300	36.8
	16.7	II	16.3	I	16.0	VII	15.2	XIII	13.2	XIX	7.8	VIII	7.7	720	20.4
	7.9	XVIII	7.9	XVII	7.1	I	6.9	XII	6.3	XI	6.2	XIX	4.7	388	10.9
I	4.7	III	4.3	XVIII	4.3	II	3.1	XIV	2.9	XV	2.5	I	2.1	219	6.2
	13.8	I	13.2	XIX	12.5	VI	12.0	XIV	11.9	XII	11.9	XI	11.4	592	16.8
II	6.3	XIX	6.3	XV	5.9	XI	5.7	XVI	4.7	XIII	4.6	XII	2.8	352	9.9

ugh, Typhoid Fever, and Diarrhoeal Diseases.

In the next table we show the relation of the principal causes of death to age-distribution. This gives for each of ten groups of ages the five chief causes of mortality. We present simply the numbers of the deaths, reliable data of population distributed according to ages being wanting,—an essential element in the proper calculation of death-rates. We here observe that the diarrhoeal diseases (cholera infantum predominating) were the most destructive cause of infant mortality; children between five and ten years of age were carried off by diphtheria and croup; then consumption heads the list for all ages from ten to seventy; and after seventy old age appropriately heads the list.

The Five Chief Causes of Death at Ten Different Groups of Ages. — 1876.

	Under 5.	5-10.	10-20.	20-30.	30-40.
1	Diarrhoeal Diseases . . . 638	Diphtheria and Croup 193	Consumption 110	Consumption 404	Consumption 287
2	Diphtheria and Croup . 462	Scarlet Fever 111	Typhoid Fever 35	Violence 54	Violence 55
3	Marsamus and Inanition 462	Brain Diseases 86	Heart Diseases 29	Typhoid Fever 41	Pneumonia 61
4	Brain Diseases* 433	Consumption 27	Diphtheria 23	Heart Diseases 38	Heart Diseases 48
5	Scarlet Fever 323	Pneumonia 10	Brain Diseases 27	Pneumonia 37	Brain Diseases 40

	40-50.	50-60.	60-70.	70-80.	Over 80.
1	Consumption 132	Consumption 104	Brain Diseases 80	Old age 90	Old age 144
2	Pneumonia 66	Brain Diseases 61	Heart Diseases 76	Brain Diseases 59	Brain Diseases 23
3	Brain 55	Pneumonia 56	Consumption 75	Heart Diseases 58	Pneumonia 21
4	Heart 53	Heart Diseases 51	Pneumonia 71	Pneumonia 38	Bronchitis 13
5	Violence 50	Violence 36	Cancer 46	Consumption 32	Heart Diseases 13

* Tubercular Meningitis (154); Meningitis (147); and Convulsions (152).

The following table answers the question, *What are the ages at which the chief causes of death occur?* The figures may be read thus: In 1876, scarlet fever was most fatal in childhood, 95 per cent. of those dying from that cause having been under ten years of age; consumption was most fatal in the third decade of life, nearly a third of the deaths having occurred in that period.

Table showing at what Period of Life the Principal Causes of Death were most fatal in 1876.

	1.		2.		3.		4.		5.		6.		7.		8.		9.		ALL AGES.	
	Period.	Percentage.	Period.	Percentage.	Period.	Percentage.	Period.	Percentage.	Period.	Percentage.	Period.	Percentage.	Period.	Percentage.	Period.	Percentage.	Period.	Percentage.	Total Deaths.	Percentage.
Scarlet Fever . . .	Und'r 10	95.0	10-20	3.9	20-30	1.1	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	457	100.
Diphtheria	Und'r 10	91.9	10-20	4.3	20-30	1.5	30-40	1.2	40-50	0.3	. . . .	. . . .	60-70	0.3	. . . .	. . . .	. . . .	. . . .	590	100.
Croup	Und'r 10	100.0	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	145	100.
Diphtheria & Croup	Und'r 10	93.3	10-20	3.8	20-30	1.3	30-40	1.0	40-50	0.3	. . . .	. . . .	60-70	0.3	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Typhoid Fever . .	20-30	27.5	10-20	23.5	Und'r 10	17.4	30-40	14.8	40-50	7.4	50-60	5.3	60-70	2.0	70-80	1.3	Over 80	0.8	149	100.
Diarrhoeal Diseases*	Und'r 10	93.2	70-80	1.3	60-70	1.2	50-60	1.3	40-50	1.1	20-30	0.7	Over 80	0.6	30-40	0.6	10-20	0.1	732	100.
Rheumatism . . .	20-30	18.4	40-50	18.4	50-60	13.2	70-80	13.2	30-40	10.5	10-20	10.5	60-70	7.9	Und'r 10	7.9	. . . .	. . . .	38	100.
Consumption . . .	20-30	31.1	30-40	22.0	40-50	14.0	10-20	8.4	50-60	8.0	Und'r 10	7.7	60-70	5.8	70-80	2.5	Over 80	0.5	1,300	100.
Diseases of the Brain	Und'r 10	43.2	60-70	11.1	50-60	8.4	70-80	8.2	40-50	7.6	30-40	6.5	20-30	3.9	10-20	3.9	Over 80	3.2	720	100.
Diseases of the Heart	60-70	19.6	70-80	14.9	40-50	13.7	50-60	13.1	30-40	12.4	20-30	9.8	10-20	7.5	Und'r 10	5.6	Over 80	3.4	338	100.
Bronchitis	Und'r 10	63.5	70-80	9.6	50-60	6.8	Over 80	5.9	60-70	5.0	30-40	2.3	20-30	1.4	10-20	0.5	. . . .	. . . .	219	100.
Pneumonia	Und'r 10	33.7	60-70	11.9	40-50	11.1	50-60	9.5	30-40	8.6	70-80	6.4	20-30	6.3	Over 80	3.5	10-20	2.9	592	100.
Bright's Disease . .	40-50	20.0	50-60	18.4	30-40	13.6	20-30	12.0	60-70	11.2	Und'r 10	9.6	70-80	7.2	10-20	6.4	Over 80	1.6	125	100.
Violence	Und'r 10	24.4	30-40	15.9	20-30	16.8	40-50	14.5	50-60	10.5	10-20	7.3	60-70	6.7	70-80	2.6	Over 80	2.3	344	100.

* Including Cholera Infantum.

DIPHTHERIA.

The sanitary history of the city has been marked during the last two years by an unusual and destructive prevalence of diphtheria. The presence of this disease in Boston has been simply a local manifestation of a wide-spread development of the diphtheritic poison which has not yet become exhausted after a period of activity exceptionally prolonged. The mortality from this justly-dreaded affection has recently borne such an uncommon relation to the deaths from all causes in this city, that it will be interesting to study in some detail the facts which are at our disposal concerning its distribution and other characters, with regard to age, season, and locality.

During the two years ending April 30, 1877, diphtheria was the assigned cause of 1,064 deaths in Boston. This mortality was at the rate of 30.16 in every 10,000 of the population of the city at all ages, as estimated at the middle of the period included.

If, now, we add to these 1,064 deaths from diphtheria the 353 deaths from croup that occurred during the same period, we have an aggregate of 1,417 deaths from these combined causes, and a rate of 40.16 per 10,000 of the population of 1876.

There are many good reasons for including in our analysis the two diseases as above indicated, and for not limiting our study to the deaths certified as having been caused by diphtheria alone. Many excellent authorities might be cited who advocate the actual identity of croup and diphtheria; and certainly the natural history, the local manifestations, and the fatality of the two maladies, present many points of resemblance which lend color to such a view. Moreover, we cannot ignore the probability that, in consequence of this close similarity, many deaths have been certified as caused by one of these diseases, when a more exact and intelligent discrimination might have determined that the other was the real cause. This interchange and overlapping are due in part to erroneous certifying, the fruit of imperfect diagnosis; in part to the lamentable ignorance of some of those called upon for death-certificates, but who are really unable to make accurate distinctions in any matters demanding trained intelligence. For these reasons there seems to be a propriety in recognizing, in mortality statistics at least, an alliance between croup and diphtheria. By combining the statistics of both diseases, we are at least tolerably certain of including all the data of each disease.

Season. — The following table gives the distribution of this mortality from diphtheria, from croup, and from both diseases, according to season. We see that in the range of monthly mortality from diphtheria, during the two years, a double fluctuation is observed, the highest points being reached in January and December of 1876, and the lowest points being in May, 1875, and September, 1876. A similar double curve, almost coincident with that of diphtheria, is marked by the monthly deaths by croup; the highest points being May, 1875, and December, 1876, and the lowest points being in the spring and summer months of 1875 and 1876. This parallelism of the two diseases, their rise and fall together, affords another evidence of the propriety of regarding them together.

	1875.								1876.								1877.								
	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	Total.
Diphtheria . .	14	19	29	19	31	63	81	87	98	75	59	39	41	39	31	30	24	43	39	59	37	43	37	27	1,064
Croup	11	11	11	11	21	32	39	30	31	12	13	15	17	8	5	5	3	10	8	17	12	9	15	7	353
Diphtheria and Croup	25	30	40	30	52	95	120	117	129	87	72	54	58	47	36	35	27	53	47	76	49	52	52	34	1,417

Undoubtedly it is possible to trace a causative relation between cold, damp weather and the prevalence of the diseases which we are studying. We should expect that an accurate disease registration would reveal the fact that diphtheria and croup increase and subside with the access and decline of those meteorological conditions. But we have failed to determine with satisfactory clearness a close coincidence between the highest death-rate from diphtheria in the recent epidemic and the lowest temperature. The month of January, 1876, for example, in which the greatest monthly mortality was registered, was not as cold as the next succeeding month of February, when the mortality was declining.

Probably one reason for the more active operation of the diphtheritic poison in cold weather lies in the fact that during the winter and early spring months people remain much more within doors than at other seasons, and, therefore, the exposure to the conditions favorable to the development of the disease is by so much increased.

Ages. — The next table shows how the 1,417 deaths from diphtheria and croup were distributed with regard to the age of the decedents.

The average age of all who died from diphtheria during the two years was 4 years, 9 months and 28 days. Omitting from the calculation all those who died at ages above 15 years, the average age is reduced to 3 years, 11 months and 28 days.*

The average age of the 353 who died from croup was 2 years, 9 months, and 21 days. All these decedents from croup were under 10 years old.

These results show how terribly destructive these diseases are to infant life : —

	Under 6 Months.	6 to 12 Months.	1	2	3	4	5	6	7	8	9	10 12	12 15	Over 15	Total.
Diphtheria . .	25	66	184	178	141	114	99	75	50	43	18	28	11	32	1,064
Croup	10	25	98	86	53	33	24	16	5	2	1	..	..	..	353
Total	35	91	282	264	194	147	123	91	55	45	19	28	11	32	1,417

We may show a little more clearly the relation of age to mortality by a calculation of the ratio per cent. of decedents at different ages to the whole number. These percentages are given in the following table. They show that deaths under one year, from either diphtheria or croup, are comparatively infrequent; that the mortality falls most heavily on infants between one and two years old; that in this respect croup exceeds diphtheria; that after the age of two years there is a marked and continuous decline in the percentage.

* The decedents from diphtheria, whose age exceeded 15 years, were as follows : —

Aged 15.....	3	Aged 36.....	1
" 16.....	2	" 37.....	1
" 17.....	1	" 40.....	1
" 20.....	5	" 41.....	1
" 21.....	1	" 45.....	1
" 23.....	2	" 52.....	1
" 25.....	1	" 62.....	1
" 27.....	2	" 64.....	1
" 30.....	2	" 65.....	1
" 31.....	2	" 67.....	1
" 34.....	1		

	Under 6 Months.	6 to 12 Months.	1	2	3	4	5	6	7	8	9	10 12	12 15	Over 15	Total.
Diphtheria . .	2.4	6.2	17.3	16.8	13.3	10.7	9.3	7.0	4.7	4.0	1.7	2.6	1.0	3.0	100.
Croup	2.8	7.1	27.8	24.4	15.	9.3	6.8	4.5	1.4	0.6	0.3	. .	. .	. . .	100.
Both Diseases .	2.5	6.4	19.9	18.6	13.7	10.4	8.7	6.4	3.9	3.2	1.3	1.9	0.8	2.3	100.

Whether the results exhibited in the foregoing table are really trustworthy, as showing at what age diphtheria and croup destroy most lives, may best be demonstrated by means of death-rates for the two diseases calculated upon the number living at the different ages and groups of ages. We have not the data of population requisite for this desirable result. We can only approximate by using the facts supplied by the census of 1875, taken at the very beginning of the period under observation. The death-rates per 10,000 at different ages upon this basis are given in the next table. It will be seen that these rates confirm the observations just made, and show that infants a year old supply an excess of the victims of both diphtheria and croup. While only one in 10,000 of those living at ages above 15 was destroyed by diphtheria, and only six at ages between 12 and 15, the rate for ages between 1 and 2 years reached 316, or more than ten times the mean rate at all ages.

	Under 6 months.	6 months to 12 months.	1 year.	2 years.	3 years.	4 years.	5 years.	6 years.	7 years.	8 years.	9 years.	10 to 12 yrs.	12 to 15 yrs.	Over 15.	Mean (all ages).
Diphtheria	63	157	316	209	185	164	144	113	77	68	31	25	6	1	31
Croup	25	59	168	101	69	48	35	24	8	3	2	.	.	.	10
Total	88	216	484	310	254	212	179	137	85	71	33	25	6	1	41

Local Distribution. — It is well known that medical opinion, with regard to the origin and mode of propagation of diphtheria, has not yet reached that degree of unanimity which carries full authority. Examination of standard works on practical medicine and of files of medical journals discovers very great diversity of views among writers of

equal weight. With some the purely contagious character of the disease is made prominent. With others local conditions of filth and dampness, organic decomposition, and insanitary social relations, poverty and overcrowding are the essential factors determining the development and spread of the diphtheritic miasm. Others regard the disease as due to a complex cause, in which contagion and local uncleanness combine, as chief elements, to foster and disseminate the destructive agent.* This diversity of views upon the etiology of a greatly dreaded malady is a hindrance to the development of any consistent method for the prevention and control of an epidemic by sanitary means.

We must await the farther investigations which shall elucidate points at present speculative and supply the basis for effective sanitation.

It is obvious that a most fertile field for such investigation is afforded by the registration of mortality. Diphtheria is fatal in a tolerably uniform ratio of the number of cases attacked; that is to say, epidemics do not vary widely in their intensity and destructiveness, so that statistics of deaths from this cause are a fair index of the inroads of the disease upon the public health. It is further obvious that facts pertaining to the local distribution of diphtheria are of especial interest in explaining and illustrating etiological theories. If, for example, contagiousness is the essential characteristic of this disease, we shall find the deaths distributed quite generally without regard to special local conditions. If, on the other hand, the disease depends, for its origin and spread, upon insanitary social and soil relations, we shall see epidemics shunning healthful localities and always at home in ill-drained, sewage-sodden, miasmatic regions, inhabited by an unwholesome, overcrowded, improvident population.

Now, what testimony has Boston to offer on these points, gathered from the experience of the last two years? In the first place, the evidence of district mortality-rates from diphtheria and croup is available, as shown in the following

* We do not feel that we shall misrepresent the general feeling of the medical profession and of sanitarians when we state that to filth acting through the medium of the atmosphere is assigned by far the largest share of the blame in the matter of the etiology of diphtheria. Statisticians classify the disease as a zymotic or "filth" disease. Among the most recent statements to this effect, we find the following by E. M. Snow, M.D., the well-known sanitarian, and recently the President of the American Public Health Association. In his observations on the public health of Providence, R.I., for the month of May, 1877, he says: "With reference to diphtheria, which is now increasing in the city, it is of the utmost importance at the present time that our citizens should attend to the removal of all filth that can be removed, and to the thorough disinfection of such as cannot be removed. Foul air from privy-vaults and cesspools is thought to be a specific cause of diphtheria. The present is the time for effectual action in this matter."

table, the nineteen districts being the same as those described in connection with the general mortality statistics of the city on previous pages.

Diphtheria and Croup, 1875-77. Mortality rates per 10,000 of the Estimated Population in 1876.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
Diphtheria	50.8	41.5	34.7	29.9	10.1	29.6	16.0	27.3	35.9	38.9
Croup	9.1	10.1	10.9	21.9	6.2	5.6	5.5	2.1	13.1	13.9
Total	59.9	51.6	45.6	48.8	16.3	35.2	21.5	29.4	49.0	52.8

	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.	Whole city.
Diphtheria	34.7	33.1	25.2	19.6	35.6	24.5	30.7	22.4	37.6	30.16
Croup	17.1	14.1	10.6	4.3	12.6	7.5	6.3	5.0	7.8	10.00
Total	51.8	47.2	35.8	23.9	48.2	32.0	37.0	27.4	45.4	40.16

These district mortality-rates do not present such distinctive characters as the believer in uncleanness as a cause of diphtheria would like to see. For example, the greatest number of deaths in proportion to population occurred in the upper part of East Boston, a section not specially characterized by unwholesome local or social conditions; much of the territory is high land, well drained, and occupied by a thrifty class of people. Then, again, the Nineteenth District (Brighton), rural in character, sparsely settled, and presenting many attractive and apparently salubrious features, had a diphtheria death-rate considerably in excess of that of the city at large. On the other hand, we find that at the "North End" (District IV.), a section whose name has for many years been synonymous with bad material and moral conditions, the inhabitants were blessed with comparative immunity from the inroads of diphtheria, although the death-rate from croup was excessive. But the next adjacent section of territory (District V.) is a surprising exception; this is the region around Haymarket square, a locality formerly occupied by a mill-pond, but at present inhabited, upon the poorly sewered filled land which has taken the place of the mill-pond, by a people of the poorer class, crowded in tenement blocks. In this insalu-

bricious territory, presenting in its filth and in its compact population just the conditions for the spread of a miasmatic-infectious epidemic, the death-rate from diphtheria was lower than in any other part of the city, — an anomaly most difficult to explain.

The eccentricities in the local distribution of diphtheria during the past two years in Boston are shown somewhat more prominently in the next table, which gives an ascending scale of death-rates in the districts, from the lowest to the highest, from diphtheria alone and from diphtheria and croup combined : —

Diphtheria	V.	VII.	XIV.	XVIII.	XVI.	XIII.	IV.	VIII.	VI.	CITY.
	10.1	16.0	19.6	22.4	24.5	25.2	26.9	27.3	29.6	30.16
Croup and Diphtheria	V.	VII.	XIV.	XVIII.	XVI.	XIII.	VI.	XIII.	XVII.	CITY.
	16.3	21.5	23.9	27.4	29.4	32.0	35.2	35.8	37.0	40.16

Diphtheria	XVII.	XII.	III.	XI.	XV.	IV.	XIX.	X.	II.	I.
	30.7	33.1	34.7	34.7	35.6	35.9	37.6	38.9	41.5	50.8
Croup and Diphtheria	XIX.	III.	XII.	XV.	IV.	IX.	II.	XI.	X.	I.
	45.4	45.6	47.2	48.2	48.3	49.0	51.6	51.8	52.8	59.9

These results, it must be confessed, are a surprise and, in some respects, a disappointment. The etiology of diphtheria would be much clearer if we found the disease always most abundantly disseminated in localities well adapted for the germination and spread of the miasmatic and infectious group of diseases. We are compelled to admit that it has not been so found in this invasion.

But it may very properly be objected that considerable territorial areas may present quite uniform and satisfactory sanitary characters as a whole, while individual dwellings in those sections may have exactly the unwholesome qualities upon which stress is laid; so that these dwellings, if inspected, would be found in a condition to explain the mysteries of the diphtheritic death-rates of the districts to which they belong. To answer this objection, we offer the results of house-to-house inspection. For several months, until sickness overtook the inspector who had the work in charge, a careful examination was made of every dwelling in which a death from diphtheria or croup had occurred. The inspector was especially chosen for his fitness for the work, for his close observation and keen and accurate detection of

imperfections in dwelling-house hygiene. The results of the investigation are summarized in the following table, which expresses by percentages the condition in which the infected habitations were found. It should be remembered that the inspection did not cover all the cases of diphtheria and croup; but, as it was in progress mainly during the months when diphtheria prevailed most extensively, the results, both numerically and in point of fact, are valuable:—

Percentages.	Premises all right.	House-drain defective.	Premises filthy.	Surroundings objectionable.	Total.
Diphtheria . .	47 per cent.	39 per cent.	3 per cent.	11 per cent.	100.
Croup	61 “	25 “	9 “	5 “	100.

It thus appears, under the head of diphtheria, that nearly one-half the premises inspected (47 per cent.) presented nothing objectionable in point of drainage and general cleanliness; in 39 per cent. the drainage was defective; in the small proportion of 3 per cent. the yards and cellars were dirty; and in the remaining 11 per cent. sunken lots, stagnant water, or filthy dumps made the surroundings open to objection. The summary for croup makes a still more favorable exhibition.

The results here shown do not carry the assurance that our observations upon the diphtheria death-rates were erroneous. If filth be the sole or the chief cause of diphtheria, our inspector should have found irreproachable very many less than 47 per cent. of the houses in which the disease had occurred. Consistently, every one of these dwellings should have presented some sanitary defect. It is true many of the habitations visited gave reason enough for the existence of fatal sickness within their walls, and many illustrations of a condition of things thoroughly bad might be quoted. But these unwholesome dwellings were not sufficiently numerous to establish unequivocally a rule of badness; indeed, they were not as numerous as one would like in order to confirm a theory of the cause of diphtheria. So far as our evidence goes, we are not yet prepared to affirm that diphtheria occurs uniformly or generally in unwholesome houses or on unwholesome territory.

As final confirmatory testimony of the truth of this observation, — less direct, indeed, and less specific than that just alluded to, but valuable in a certain sense, — we give the summary of the medical opinions elicited during the progress

of this investigation. Hoping to obtain definite information from medical men, the Board for some time addressed a circular with a series of questions to every physician who returned diphtheria as a cause of death, asking brief replies concerning the sanitary condition of the premises in which the fatal case had occurred. The answers to these interrogatories were not always satisfactory; the respondents were not invariably men (or women) of superior intelligence; many of the replies were withheld; therefore, after the results of the attempt were found to disappoint expectation, the experiment was abandoned. Nevertheless, in one respect it served a useful purpose; though lacking the quality of exactness so desirable in all such work, it showed that medical scrutiny had not discovered a common condition of unwholesomeness in habitations consistent with the generally accepted belief concerning the origin of diphtheria.

DRAINAGE.			VENTILATION.		
Good.	Fair.	Bad.	Good.	Fair.	Bad.
42 per cent.	9 per cent.	49 per cent.	45 per cent.	14 per cent.	41 per cent.

LIGHT.			HABITS.			ODORS.	
Good.	Fair.	Deficient.	Cleanly.	Indiffer'nt.	Filthy.	Present.	Absent.
57 per ct.	13 per ct.	30 per ct.	47 per ct.	26 per ct.	27 per ct.	40 per ct.	60 per ct.

It is, then, our duty, in view of the concurrent testimony, to reject the idea that filth fosters the origin and dissemination of diphtheria. Because diphtheria has prevailed less in the South Cove District than in Brighton; less in the "Old Mill Pond" District than on Beacon Hill, and less at the "North End" than at West Roxbury; and because expert inspectors have found the disease occurring in many houses whose sanitary condition was above reproach, and because physicians have reported that they have observed the fatal issue to come in wholesome and unwholesome dwellings alike, shall we be justified in advising a disregard of sanitary measures in the presence of a diphtheritic invasion? Are defective house-drains, offensive privies, broken cesspools, obstructed water-closets, innocent of mischief? We are not

inclined to that conclusion. On the contrary, we believe that while the cause or causes of diphtheria remain obscure, eluding at present the keen search of those who would discover them, common sense and common prudence dictate that the most comprehensive precautions should be applied till the time shall come when increased knowledge shall eliminate such as are superfluous. A single invasion like the present does not afford enough experience for a clear solution of the question. Although the testimony of the last two years does not sustain the theory which assigns to uncleanness, acting through the air, the paramount influence in the propagation of diphtheria, it is nevertheless unwise at present to be dogmatic about this or other views. We cannot, as yet, forego the conviction that filthy local conditions invite the manifestation of the zymotic diseases, of which diphtheria is a conspicuous example. The disease may not accept the invitation, but it is not safe to offer inducements. The appearance of diphtheria in any household affords reasonable ground for suspicion that the sanitary condition of the premises is not altogether right, and should be interpreted as an urgent call for the most careful inspection, and for the earliest possible amendment of whatever is found wrong. In recognition, also, of the obviously infectious character which diphtheria has many times displayed under circumstances unobjectionable from a sanitary point of view, a case of diphtheria should be isolated during its treatment; if a fatal issue occurs, the funeral services should be private, — notice to that effect being given with the published notice of the death; and the dead body itself should be disinfected and concealed from view.

Until trustworthy investigation shall have succeeded in demonstrating the preventive measures which are effectual and requisite, and the non-preventive measures which are superfluous become useless, wisdom and prudence declare that it is better to overstep the limits of caution, rather than to come short of them, in dealing with a disease like diphtheria.

SCARLET FEVER.

The two great problems which are at present engaging the attention of students of public hygiene, are how to prevent, if possible, the occurrence of disease, and how to reduce to a minimum the danger to a community from disease when it exists. The first of these problems, dealing as it does with various questions, which possess rather a scientific than a medical interest, has already attracted the attention of many

distinguished workers in various parts of the world, and the result has been that a very marked improvement has taken place within the last half-century as regards drainage, sewerage, the erection of cheap and properly constructed tenement houses, the building of elaborate water works, the appointment of local Boards of Health, and the adoption of various measures, all tending to a general improvement in the sanitary condition of the people. The second problem, however, is one which necessarily attracts the attention of the members of the medical profession only, who, in their daily practice, are constantly engaged in the study of those diseases which are at all times more or less present in a community, and which form a large part of the annual mortality of cities and towns.

These diseases are contagious, and, therefore, not unfrequently appear as epidemics, carrying off annually a greater or less number of victims, according as their type is, for the time being, mild or malignant. Among these diseases are chiefly to be named cholera, yellow fever, small-pox, and scarlet fever. The first three of these appear, as a rule, only in well-marked epidemics, sporadic cases being of such rare occurrence as scarcely to attract attention. Scarlet fever, on the other hand, is always present in a community; varying, it is true, however, in its type, and possibly in its contagious character. The sudden appearance in a community of cholera, yellow fever, and small-pox, at once attracts public attention, and any effort of the authorities, advised or sanctioned by the medical profession, is at once met with the popular approval. As a natural result, therefore, the duration of such epidemics is short, and the means adopted for the checking of their further spread are speedily effectual. Scarlet fever, on the other hand, is always present, and yet there seems to be no thought in the community at large of classifying it among the other diseases just mentioned, as being in any way capable of being controlled by the adoption of proper sanitary rules and regulations. Yet the number of its victims is much larger than that of small-pox has ever been since the introduction of vaccination.

In Boston during the last twenty-eight years (1849-1877) there have been 2,519 deaths from small-pox and 6,157 from *scarlet fever*. In this calculation no mention of course is made of the vast number of patients who, while they survive the attack of scarlet fever, are, however, crippled for life, and doomed to spend the remainder of their days as confirmed invalids. An examination of the deaths resulting from scarlet fever and small-pox shows also that while the latter appears in the city as a well-marked

epidemic, and as such is speedily attacked by every means at the disposal of the Health Department, the former is present always to a great extent without scarcely attracting any attention.

Deaths from Scarlet Fever.		Deaths from Small-Pox.	
1867 306	1873 474	1867 144	1873 302
1868 266	1874 269	1868 8	1874 2
1869 330	1875 555	1869 6	1875 1
1870 205	1876 458	1870 32	1876 3
1871 111	—	1871 28	—
1872 258	3,232	1872 738	1,264

The startling statement which appears from the above table, that there were, during the last three years, only 6 deaths from small-pox to offset the 1,282 from scarlet fever, may well make one wonder at the apparent apathy which exists in the community as to the danger to the public from constant presence of scarlet fever in our midst.

Another potent reason for attempting to control the ravages of scarlet fever is to be found in the fact that it is mainly a disease of childhood. Out of 148,829 deaths collected by Murchison, 142,337 were of children under 15 years of age. The predisposition to the disease rapidly lessens with the increasing years of childhood. Small-pox, on the other hand, is limited to no age, and, with the possible exception of the earlier months of infancy, no period of life is free from its attacks. The protection of childhood from attacks of scarlet fever will, therefore, as a rule, insure a freedom from the disease during adult life.

It is well known, at least to the medical profession, that scarlet fever, like small-pox, is contagious, and that its existence is due solely to a contagion, mediate or immediate. Its spread from Europe to other countries is directly traceable to commerce. According to Professor Thomas, of Leipsic, who has recently published an admirable history of the disease, it first appeared in Iceland in 1827; in Greenland in 1847; gradually spread over a large portion of Asia, and lastly invaded India. Subsequently it appeared in Africa. In 1735 it had found its way to North America, whence it spread to South America, where the first epidemic took place in 1829. The disease was unknown in Austria until 1849.

If, then, scarlet fever is a disease where victims are far

more numerous than those of small-pox, and if its origin is due solely to contagion, as is known to be the case with variola, why is it not possible to eradicate the disease from a community, as is done with small-pox whenever that disease appears prevalent? Why, moreover, is there not a much greater necessity for so doing, when we remember that it is not only among the dead that we are to seek for the victims of this terrible disease, but also among the living, who are so frequently forced to carry with them through life the traces of a previous illness, — traces far more serious than the mere scars which may denote a preceding attack of variola?

One difficulty, which would be experienced in any attempt to diminish the prevalence of scarlet fever, could be found in the popular opposition which would naturally be at once excited if the Board should attempt to adopt the same rules and regulations in the management of cases of scarlet fever as are willingly acceded to when resorted to for the suppression of small-pox. It is hard to understand, however, why this dread of a disease, whose virulence has been so mitigated by the discovery of vaccination, should still linger in the minds of a people who can yet be brought into almost daily contact with a disease far more destructive, and yet raise no question as to the possibility of a relief from its fatal poison. One can only explain this indifference to one disease and dread of the other by remembering that a tradition of the horrors of small-pox, as it existed before the introduction of vaccination, still lingers in the popular mind, and thus occasions the almost universal fear of a disease the danger of which has been so greatly lessened.

The question of the advisability of adopting measures for the protection of the community against scarlet fever has at length come to present itself to the serious consideration of students of public hygiene in various portions of the world. In Christiania (Norway) it has been proposed to post a notice upon all houses in which a case of the disease is present. It has also been proposed (Reil) to close all houses containing cases. The erection of inexpensive barracks, the isolation of localities and districts suffering from the disease, the removal to hospital of all cases, the quarantining of cases, — these and other similar measures have all been suggested, but, so far as we know, are still *sub judice*; the question of their practicability being the one obstacle to hinder their adoption.

That the spread of the disease is largely carried on through the channels of our public schools there can be no question. The general ignorance which exists in the community as to the proper methods of reducing to a minimum the chances of

still further spreading the disease by contagion, is also a powerful factor in giving an epidemic character to the disease.

During the past year this whole subject has been repeatedly considered by the Board of Health, and at length it was determined to make a move looking towards a reduction in the annual death-rate from the disease. The first step was to include scarlet fever among the diseases which were known to be contagious and dangerous to the public health. Accordingly, the following order was issued by the Board, January 9, 1877:—

OFFICE OF THE BOARD OF HEALTH,
BOSTON, January 9, 1877.

SCARLET FEVER.

WHEREAS, Scarlet Fever is a disease contagious and dangerous to the public health, and whereas it is now prevalent in the City of Boston, therefore the Board of Health issues the following notice: That on and after January 15, 1877, the following provisions of Chapter 26 of the General Statutes will be strictly enforced:—

SECT. 47. When a householder knows that a person within his family is taken sick of any disease dangerous to the public health, he shall immediately give notice thereof to the Board of Health of the town in which he dwells. If he refuses or neglects to give such notice, he shall forfeit a sum not exceeding one hundred dollars.

SECT. 48. When a physician knows that any person whom he is called to visit is infected with any disease dangerous to the public health, he shall immediately give notice thereof to the Board of Health of the town; and if he refuses or neglects to give such notice he shall forfeit for each offence a sum not less than fifty nor more than one hundred dollars.

And it is hereby *Ordered*:

That no child from any family in which a case of this disease has occurred, or shall hereafter occur, shall, without a written permit from this Board, attend any school in this city until the expiration of four weeks from the commencement of the last case in such family. Such length of time shall be certified in writing by a physician or some responsible member of the family, the certificate to be presented to the teacher of the school before the child is admitted.

Attest:

C. E. DAVIS, JR.,
Clerk.

NOTE.—In the notification to the Board of Health, please state the name, age, street, number, and ward where the patient lives.

The order went into effect January 15, and between that time and May 31 there have been reported to the Board 963 cases. Of this number 39, or 4.05 per cent., have died. Lists are daily made out of the names reported, and one of these lists is furnished daily to each truant officer, who sees that the order of the Board, as regards attendance at school, is carried out.

The following circular letter is also at once sent to the family of the patient :—

SCARLET FEVER.

OFFICE OF THE BOARD OF HEALTH,
January 9, 1877.

The Board of Health issues the following circular of recommendations, with the hope that those not familiar with the care of scarlet fever may be benefited thereby.

Scarlet fever is like small-pox in its power to spread rapidly from person to person; it is highly contagious. The disease shows its first signs in about one week after exposure, as a general rule; and persons who escape the illness during a fortnight after exposure may feel themselves safe from the attack.

Scarlet fever, scarlatina, canker-rash, and rash fever, are names of one and the same dangerous disease.

When a case of scarlet fever occurs in any family, the sick person should be placed in a room apart from the other inmates of the house, and should be nursed, as far as possible, by one person only.

The sick-chamber should be well warmed, exposed to sunlight, and well aired; its furniture should be such as will permit of cleansing without injury, and all extra articles, such as window-drapery, woollen carpets, and the like, should be removed from the room during the sickness. The family should not mingle with other people. Visitors to the infected house should be warned of the presence of a dangerous disease therein, and children especially should not be admitted.

On recovery, the sick person should not mingle with others until all roughness of the skin due to the disease shall have disappeared; a month is considered an average period during which isolation is needed. All clothing or bedding worn or used by the patient or the nurse should be cleansed by boiling for at least one hour; or, if that cannot be done, by free and prolonged exposure to out-door air and sunlight. The walls of the room should be dry-rubbed, and the cloths used for the purpose should be burned without previous shaking. The ceiling should be scraped and whitened. The floor should be washed with soap and water, and carbolic acid may be added to the water (one pint to three or four gallons). The infected clothing should be cleansed by itself, and not sent to a laundry.

In case of death from scarlet fever, the funeral services should be strictly private, and the corpse should not be exposed to view.

Because children are especially liable to take and to spread scarlet fever, and because schools afford a free opportunity for this, the Board of Health has excluded from school every child from any family in which a case of the disease has occurred, the absence to continue four weeks from the beginning of an attack (except in cases subject to the discretion of the Board), and the scholar to be readmitted to his school-room on the certificate of a physician that the required time has passed.

The proper blanks can be obtained at this office on application.

C. E. DAVIS, JR.,
Clerk.

To allow for any exceptional case in which a child might with safety be allowed to attend school, the provision, allowing the giving of a written permission to a child, was inserted in

the order of the Board. It was found that the order was not in accordance with one subsequently issued by the School Committee, and therefore no written permissions have been granted, all such cases being at once referred to the School Committee.

Of course, it is yet too soon to state what the practical effects of such a course of procedure will be. The following figures would seem, however, to show that already there has been a marked improvement as regards the mortality from scarlet fever:—

Whole number of deaths from scarlet fever (September 24, 1875, to April 22, 1876, about eight months),	446
Whole number of deaths from scarlet fever (September, 1876, to April, 1877, eight months),	185
Decrease,	261

This period of eight months covers about four months before and four months after the adoption of the order relating to scarlet fever.

The decrease the first four months was	42½ per cent.
The decrease the last four months was	71½ “
Average decrease,	59 “

If this decrease in the number of fatal cases of scarlet fever shall continue at the close of another year, it seems evident that the marked improvement in the death-rate from scarlet fever will prove the wisdom of the course which the Board has adopted.

QUARANTINE.

The operations of our quarantine for the past year have been successful, and without any unusual changes to mark it as exceptional.

The ordinary summer regulations were put in force on the first day of June, and remained under observance until the first of November, during which four hundred and twenty-one vessels were inspected by the Port Physician.

During the remainder of the year only such vessels are examined as have had during the passage or on arrival here persons sick with some quarantinable disease.

The number of cases of disease dangerous to the public health found on board of vessels arriving in our harbor annually is comparatively small, but of sufficient importance

to require an uninterrupted vigilance through the entire year.

It is also necessary to have in readiness everything that may be necessary for the immediate transfer of patients from vessel to the island, and their comfortable care while at the hospital.

This watchfulness and care at any one port on our coast is not of local interest only, but is of national concern.

The introduction of contagious or infectious diseases into any port may be within a few hours transferred by rail hundreds of miles inland to some city or town where, among unsuspecting people, the seeds of the largest epidemic may be sown, and incalculable misery follow.

For this reason, quite as much as for local protection, a uniform care should be exercised in every port on the coast to guard, by efficient quarantine, against the introduction of pestilence from abroad.

It has been our constant aim to so improve our facilities and accommodations in quarantine that no reasonable complaint could be made as to unnecessary detention of vessels, or as to the comforts and care of patients who fall to our charge.

For the sake of comparison we will briefly state that, six years ago, the only means in the hands of our Port Physician for visiting vessels, in the discharge of his duty, and transferring patients in all kinds of weather from vessel to hospital, was a common row-boat. The frequent humiliation and disgust of the officer in charge of these duties can be understood only by an experience. Seven years ago, not a new or substantial building existed on the quarantine island, although it was well sprinkled with old wooden barracks, which were erected and used for the soldiers during the late war. Some of these barracks, with moderate repairs, served us for hospital uses for several years. The grounds, comprising about fifteen acres, served only to pasture a few young cattle or sheep during the summer. To-day, but one building, out of 20 or 30 standing on the island seven years ago, remains; that, having been almost entirely rebuilt, is in a fair condition.

A new and commodious dwelling-house has been erected; a new barn; another building for blacksmithing, carpentering, and painting (an economical and necessary resort on the island); another for the fowls, and a very neat and substantial ice-house. An oak-pile, three-sided wharf has been built, and upon it a boat-house, for the care of small boats, and a coal-bin, with a capacity of 250 tons, for the convenience of the quarantine steamer.

A new fever hospital is now in process of erection, which, when completed, will afford us more complete means for isolating one class of contagious diseases from another while under treatment.

The banks of the island have been graded and the beaches cleared of *débris*. The graves of 206 persons, who have fallen victims to one or another of the several contagious diseases, have each been marked by neat and appropriate head-boards, with inscriptions giving the name, age, and date of death, and the grounds have been enclosed by a good fence.

The land has been divided into pasturage and tillage grounds; the former, in its improved condition, being sufficient for two oxen, three cows, and a horse, and the latter cutting annually about ten tons of best quality hay, and producing very creditable quantities of potatoes, onions, beets, grain, etc., etc., which are used upon the island and quarantine steamer. With the same industry and good judgment which has been used by the Superintendent in dressing and cultivating this land, a very large increase can still be made in the products of the island.

The accompanying report of the Port Physician gives a full and interesting account of the Quarantine Department for the year, to which we respectfully refer for a detailed account.

APPOINTMENTS, ETC.

On May 7, 1876, Charles E. Davis, Jr., was re-elected Clerk of the Board. We reappointed Samuel A. Green, M.D., City Physician; Alonzo S. Wallace, M.D., Port Physician; and George W. Forristall, Superintendent of Health for the ensuing year, subject to the Mayor's approval.

The reports of the three last-named are hereto annexed.

Dr. Thomas Kittredge, who had courteously and faithfully performed the duties of Port Physician, resigned the office in March last, and William G. Kimball, M.D., was, with our concurrence, appointed Assistant Port Physician by Dr. Wallace.

The sprinkling of streets has been noticed in our annual reports for three years, recommending that the work be done by the city.

We are still of the opinion that this work should be under the charge of the city; that the streets should be wet earlier and later in the season, that more streets should be sprinkled

than now are, and that the expense should be borne by *all* who in person or property are benefited thereby. It seems to us that in both the sanitary and economical sense it would be much better to have the sprinkling of our streets thoroughly done, and as often as the inconvenience or annoyance of the dust and the waste of gravel may demand.

Our acknowledgments are due to Orin Barker, of the U. S. Signal Service, for furnishing us with daily reports of meteorological observations during the past year, and for the courtesy and promptness with which he has at all times responded when called upon for information.

REGULATIONS.

The following regulations have been made by us, and are now in force : —

CONCERNING FRUIT.

No person shall sell, or offer for sale, or have in his possession with intent to sell, in this city, any unwholesome, decayed or stale fruit or vegetables. — (August 1, 1874.)

CONCERNING HIDES AND HORNS.

Ordered, That from the first day of April to the first day of November, no green hides or horns shall be cured, stored, or be suffered to remain within the limits of the city, without a written permit from the Board of Health.

This order to take effect on the thirty-first instant. — (May 7, 1875.)

CONCERNING THE REMOVAL OF MANURE.

Ordered, That no manure shall be removed except in a tight canvas-covered vehicle, with the covering so secured to the sides and ends of the vehicle as to prevent the manure from being dropped or left in any street or way of the city, in process of removal, nor loaded in or upon any street, lane, or passage-way, nor upon or across any sidewalk. — (May 10, 1875.)

CONCERNING LEAKY CARTS.

Ordered, That no persons moving manure, house offal, swill, or filth of any kind, shall suffer it to leak or escape from any vehicle by him owned or driven, in or upon any street, court, square, lane, alley, wharf, or public enclosure, in the City of Boston. — (May 12, 1875.)

CONCERNING BURIALS.

Ordered, That on and after October 1, 1875, the Superintendent, or any person authorized to receive or bury the body of any deceased person in any burial-ground within the limits of the City of Boston, shall, as often as once in each week, report to the Board of Health of said city, the number of burials in the ground under his charge during the preceding week, together with the date of the burial, the number of the permit for burial, the name of the deceased and the name of the undertaker or other persons having charge of the body when brought to said ground or burial.

Any failure to comply with the foregoing order will subject the offender to prosecution and a penalty not exceeding one hundred dollars. — (September 10, 1875.)

CONCERNING RENDERING.

By virtue of the authority given by Chapter 26 of the General Statutes, the Board of Health of the City of Boston makes the following regulation: That on and after Nov. 30, 1875, the trade or employment of slaughtering cattle, calves, sheep, or swine, or of rendering tallow or other refuse animal matter, shall not be carried on within the limits of the City of Boston, except on the islands of the harbor or at the abattoir in the Brighton District, or at such other place or places as may hereafter be assigned by the Board of Health. — (November 6, 1875.)

CONCERNING STREET SPRINKLING, ETC.

That on and after August 1, 1876, no filthy or offensive water shall at any time be sprinkled, poured, thrown, or put upon any street of the city. Any violation of this regulation will subject the offender to prosecution and a fine not exceeding one hundred dollars. — (July 28, 1876.)

CONCERNING THE KEEPING OF COWS.

That no person shall keep or allow to be kept in any building, or on any premises of which he may be the owner, lessee, tenant, or occupant, more cows than at the rate of one for each 3,000 square feet of land, in or near the built-up portion of the city, without a written permit from the Board of Health.

Every person keeping a cow shall cause the place where it is kept to be well ventilated and drained, and kept at all times in a cleanly and wholesome condition. — (July 28, 1876.)

CONCERNING THE REMOVAL OF RUBBISH, ETC.

Ordered, That no person removing earth, dirt, sawdust, soot, ashes, cinders, shavings, hair, shreds, manure, oysters, clams, or lobsters, waste water, or any animal or vegetable substance, house offal, swill, rubbish, or filth of any kind whatsoever, shall suffer it to leak, escape, or drop from any vehicle by him owned or driven, into or upon any street, court, square, lane, alley, wharf, or public enclosure in the City of Boston. — (September 8, 1876.)

CONCERNING SCARLET FEVER.

Ordered, That no child from any family in which a case of scarlet fever has occurred, or shall hereafter occur, shall, without a written permit from this Board, attend any school in this city until the expiration of four weeks from the commencement of the last case in such family. Such length of time shall be certified in writing by a physician, or some responsible member of the family, the certificate to be presented to the teacher of the school before the child is admitted. — (January 9, 1877.)

The following is a statement of the expenses and income of this department during the year :—

Board of Health	\$12,000 00	
Clerk-hire	4,800 00	
Inspector of Nuisances . .	11,600 00	
Horse and vehicle, Board of Health	510 94	
Stationery	292 72	
Printing	1,724 55	
Advertising	324 15	
	<hr/>	\$31,252 36
Abatement of nuisances		6,379 41
Small-pox		1,683 82
Public urinals		4,368 48
Building new urinals		244 00
Burial-grounds		5,013 93
City Physician and assistant		4,200 00
Inspector of Provisions		2,000 00
Evergreen Cemetery		2,266 64
Horse and vehicle, City Physician		420 26
Contingencies		1,335 01
Removal of night-soil (clerk-hire)		1,017 00
	<hr/>	
Total expended		\$60,180 91

INCOME.

Abatement of nuisance, etc.	\$957 29	
Licenses	167 00	
Evergreen Cemetery	1,042 00	
	<hr/>	\$2,166 29

QUARANTINE DEPARTMENT.

Port Physician and assistant	\$1,900 00	
Subsistence for assistant	365 00	
	<hr/>	\$2,265 00

Gallop's Island.

Salaries, Supt. and assistants	\$1,740 47	
Subsistence	1,235 38	
Supplies	276 12	
Repairs and grading	350 90	
Medicines	35 00	
Other expenses	400 00	
	<hr/>	4,037 87

Amount carried forward, \$6,302 87

Amount brought forward,

\$6,302 87

Steamer "Samuel Little."

Salaries, captain and crew	\$3,900 00	
Subsistence	649 38	
Fuel	466 25	
Water-rates	100 00	
Repairs, painting, etc.	5,148 11	
Other expenses	92 39	
	<hr/>	10,356 13
Stationery	3 75	
Printing	21 49	
Advertising	10 50	
	<hr/>	35 74
		<hr/>
		\$16,694 74

INCOME.

Amount of fees collected from vessels	\$2,590 00
Board and medical care of patients	104 25
For vegetables	43 55
Amount left over from last year	16 00
	<hr/>
Total	\$2,753 80

RECAPITULATION.

Appropriated : —

Board of Health	\$83,000 00	
Evergreen Cemetery	800 00	
Quarantine Department	16,700 00	
	<hr/>	\$100,500 00

Expended : —

Board of Health	\$58,270 27	
Evergreen Cemetery	2,266 64	
Quarantine Department	16,694 44	
	<hr/>	77,231 35

Unexpended	\$23,268 55
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INCOME.

Board of Health	\$1,124 29
Evergreen Cemetery	1,042 00
Quarantine Department	2,753 80
	<hr/>
	\$4,920 09

All of which is respectfully submitted.

SAMUEL H. DURGIN, M.D., *Chairman.*

ALONZO W. BOARDMAN.

HENRY G. CROWELL.

REPORT OF THE CITY PHYSICIAN.

SAMUEL A. GREEN, M. D.

REPORT OF THE CITY PHYSICIAN.

CITY PHYSICIAN'S OFFICE, May 1, 1877.

TO THE BOARD OF HEALTH :—

Gentlemen,—I have the honor to submit the following report of this office for the year ending April 30.

There have been 1,287 persons vaccinated, of which number 6 were revaccinated. Certificates of vaccination have been given to 632 children for their admission into the public schools. Vaccine virus has been furnished to 25 physicians, residents of the city. Visits have been made to the jail daily, or oftener, as the occasion required, and 1,114 prisoners have been examined for complaints, real or feigned. The sick at the City Prison, and at the Temporary Home, have been seen whenever it was necessary. At the Home, 324 visits have been made during the year; two births and two deaths have occurred in the same period. I have made at different police-stations 128 visits, to see prisoners and others who required medical attendance. These cases, for the most part, have been surgical ones, and have occurred generally in the night-time.

At the request of the Chief of Police, I have examined 22 candidates for the police force, to see if they were physically qualified to perform the duties of the office; and, under a similar request from the Fire Commissioners, I have examined 46 applicants for the Fire Department.

I have seen, also, during the year, 307 bodies of persons who have died without a physician in attendance during their last illness. These cases comprise principally those who die from chronic disease when there has been no medical care for months before death, and those who die suddenly. They include, also, those who die at birth, or soon after, with no physician to make the necessary returns. In such instances a careful examination is made, the symptoms learned, and a diagnosis reached sufficient for all practical purposes. The law requires a medical certificate of death before a permit is granted to bury a body; and these exami-

nations are made to conform with the law, as well as to collect the statistics for the bills of mortality.

In conclusion, I wish to speak of the pleasant relations existing between the members of your Board and myself, which have contributed largely to lighten the labors of my office; and I wish, also, to acknowledge the faithful services of my assistant, Dr. McCollom.

Very respectfully, your obedient servant,

SAMUEL A. GREEN, M.D.,
City Physician.

REPORT OF THE PORT PHYSICIAN.

ALONZO S. WALLACE, M. D.

REPORT OF THE PORT PHYSICIAN.

TO THE BOARD OF HEALTH: —

Gentlemen, — The fifth annual report of the Port Physician is herewith respectfully presented. During the year there has been comparatively little sickness of a contagious character found on vessels.

Of the four hundred and twenty-six vessels examined, thirteen only were placed in quarantine; eight were detained either because of sickness or death during the passage, or on account of having sailed from an infected port; the other five had sickness on board on their arrival here.

The schooner "Geo. K. Hatch," arriving August 19 from Havana; the steamer "Seminole," arriving September 14 from Savannah, Ga.; and the schooner "R. and J. Freeman," arriving March 30 from San Domingo, had each one case of yellow fever on board.

The steamer "Seminole" was detained five days, in order to disinfect the vessel and cargo.

The schooner "Mabel Rose" arrived at quarantine November 28 from Philadelphia, from which four of the crew were removed, two being sick with small-pox and the others having been exposed. The brig "E. A. Bernard" arrived July 4, from Sagua la Grande, with the captain's wife sick on board with typhus fever. She had been suffering eleven days, was too sick to be removed, and died in a few hours. The body was taken to Gallop's Island, and prepared for removal to her home.

The length of time these vessels were detained varied from ten hours to five days.

The quarantine register shows the following record of vessels examined during each month, for the year 1876, commencing June 1st and ending October 31st.

JUNE.									
Steamers	.	.	.	.	.	.	.	.	8
Ships	.	.	.	.	.	.	.	.	5
Barks	.	.	.	.	.	.	.	.	27
Brigs	.	.	.	.	.	.	.	.	26
Schooners	.	.	.	.	.	.	.	.	52
<hr/>									
Total	.	.	.	.	.	.	.	.	118

JULY.

Steamers	11
Ships	5
Barks	15
Brigs	26
Schooners	24
Total	<hr/> 81

AUGUST.

Steamers	12
Ships	0
Barks	14
Brigs	15
Schooners	24
Total	<hr/> 65

SEPTEMBER.

Frigate	1
Steamers	12
Ships	4
Barks	22
Brigs	23
Schooners	39
Total	<hr/> 101

OCTOBER.

Steamers	11
Ships	1
Barks	11
Brigs	13
Schooners	20
Total	<hr/> 56

NOVEMBER, DECEMBER, AND MARCH.

Steamers	2
Ships	0
Barks	0
Brigs	1
Schooners	2
Total	<hr/> 5

RECAPITULATION.

Frigate	1
Steamers	56
Ships	15
Barks	89
Brigs	104
Schooners	161
<hr/>	
Total	426

Amount of fees collected from vessels . .	\$2,590 00
For board and medical care of patients . .	104 25
For vegetables	43 55
Amount left over from last year	16 00
<hr/>	
Total	\$2,753 80

One vessel included in the foregoing list was a ship-of-war, and by courtesy passed without fee. There were also one brig and two schooners, from which fees could not be collected.

The vessels examined at this station during the past year, hailed from the following ports : —

West Indies and Bermuda	199
Great Britain and Ireland	68
Coastwise (including Gulf of Mexico)	49
South American	24
Mediterranean	19
East Indies	17
France, Spain, and Portugal	13
East coast of Africa	8
West coast of Africa (including Cape de Verde Islands)	7
Azores	7
Russia	5
Norway	4
Holland	3
Persia, Belgium, and Germany, each 1	3
<hr/>	
Total	426

The following table has been prepared, for the purpose of showing the number of vessels and passengers which have been examined at this station, from 1863 to 1876, inclusive : —

Years.	No. Vessels.	No. Passengers.
1863	228	1,765
1864	No record.	No record.
1865	320	2,188
1866	668	6,481
1867	306	401
1868	376	513
1869	333	6,894
1870	530	13,225
1871	540	11,828
1872	348	12,890
1873	625	13,822
1874	589	11,017
1875	504	6,754
1876	426	4,649
Total in 13 years,	5,793	92,436

During the year there have been admitted to Gallop's Island hospital sixteen patients.

From vessels, three cases of yellow fever, two of small-pox, and two supposed to be infected. The remaining nine were from the city; six having small-pox and three being considered as infected persons. All of the cases of yellow fever recovered; three small-pox patients died and five recovered.

Some interesting facts are connected with two of the small-pox patients, both claiming to have had the disease before.

The following will serve as a brief record of each case:—

CASE 1. Female; aged 22; was admitted with small-pox; had been vaccinated in infancy and presented one fair cicatrix; states that she had small-pox nine years ago, and exhibited good cicatrices as proof; recovery took place; length of time in hospital, ten days.

CASE 2. Male (colored); aged 27; was admitted with small-pox; had been subjected to vaccination in infancy, and as the result possessed two good cicatrices; states that he had small-pox ten years ago and showed sufficient evidence of it; recovery resulted; length of time in hospital, twenty-four days.

The history of these cases seems to show that susceptibility to small-pox, destroyed by vaccination or by the disease itself, may subsequently return.

The small-pox hospital has been whitewashed inside and out, and painted inside. It is not a substantial building, and, as it is gradually settling, I would recommend that it be

raised, the rotten sills removed, and new ones substituted. Unless this be done, it will, in a few years, be unfit for use.

I would suggest that this hospital be occupied the whole year by nurses, in order that it may be in a suitable condition for the admission of patients, and in a state of preparation better adapted to the immediate wants of the sick than is the case when it has been closed during the absence of sickness. The occupants of this building would also have the care of the other hospital on the island, and keep it in a proper condition for the reception of patients.

There is now in course of erection a hospital building, 60 feet by 20, for the accommodation of yellow-fever and ship-fever patients. It will be so arranged that the two diseases can be kept entirely separate.

When this building is completed we shall have accommodations for the proper isolation and treatment of three quarantinable diseases.

We have on hand ten hospital tents, that can be used in case of cholera.

The following is an inventory of furniture, bedding, crockery, etc., in hospital use, and stored at Gallop's Island :—

Bedsteads (wooden)	158	Knives	34
“ (iron)	44	Forks	61
Chairs	50	Spoons	72
Stands	54	Coffee-pots	10
Stoves	10	Lanterns	5
Bath-tubs	3	Lamps	3
Earth-closets	5	Flat-irons	8
Urinals	28	Mattresses (hair)	72
Bed-pans	18	“ (husk)	125
Chambers	84	Pillows (feather)	21
Pitchers	8	“ (hair)	56
Spit-cups	32	“ (husk)	91
Feed-cups	11	Pillow-cases	53
Wash-bowls	3	Blankets	229
Wash-basins	5	Sheets	58
Bowls	24	Pillow-ticks	58
Mugs	106	Bed-ticks	10
Plates	45	Towels	7
Platters	5	Curtains	66

The cultivated land, under the faithful supervision of Mr. Severance, overseer, has, in many respects, yielded larger returns this year than ever before.

The amount of hay and of potatoes raised is less than last year, because of severe drought and the potato-bug injury.

The chief articles produced on the island, and the quantity of each, are as follows :—

Hay	8 tons.
Corn fodder	3 “
Oats	74 bushels.
Potatoes	150 “
Beets (including mangolds)	300 “
Onions	85 “
Tomatoes	35 “
Apples	30 “
Cabbages	75 heads.
Pumpkins	175

The dairy has supplied the island and steamer with milk, but has not, as in former years, furnished the requisite amount of butter, owing to the loss of the most valuable cow early in the summer. The remaining cow was exchanged for a new milch one, and another bought to take the place of the one that died.

Butter-making commenced in September, and from that time until the first of April, 154 pounds were produced.

On account of the small amount of hay raised, the oxen were exchanged for a young pair. The live stock at the present time comprises one horse, two oxen, three cows, five pigs, and about sixty-five hens.

Another much-needed building has been added, — an ice-house 21½ feet by 15½, which has been stocked with ice from Deer Island, through the kindness of the Superintendent, Mr. Underwood.

The barn cellar, which was somewhat improved last year, has been still further enlarged and improved, so that now a suitable place is provided for storing all of the vegetables.

In the carpenter and paint shops, built last year, there has been a sleeping-room finished for the male help. The small buildings and alterations have been made by help on the island, and at very small cost to the city.

A good road has been constructed from the dwelling-house to the barn, a distance of 413 feet.

The cultivated portion of the island has been separated from the pasture-land by a substantial fence one hundred and three rods in length. The grave-yard has also been surrounded by a neat paling, forty-three rods in length. That portion of land which extends either side of the wharf, more especially towards the hospital buildings, was of a stony character, and would not readily shed water in a wet season. It has been graded, several hundred loads of loam put

upon it, and sown with grass seed, thus adding much to its value and appearance.

Some changes for the better have been made in the dwelling house, by the addition of a water-closet to the bath-room, and the cementing of the floor in the cellar.

The quarantine steamer has undergone several repairs and changes during the winter. The boiler having become unsuitable for further use, it was replaced by a new one. And another change which contributes greatly to the comfort of the crew was the raising of the pilot-house, and the construction of a cook and dining room underneath. This affords ample room below for the crew.

It gives me pleasure to acknowledge my indebtedness to Guy C. Underwood, Esq., Superintendent of the Deer Island Institutions, for many courtesies and favors.

Dr. Thomas Kittredge, who has been Assistant Port Physician for a year and a half, resigned March 31, 1877, to enter upon private practice. Dr. Kittredge was a faithful, efficient, and courteous officer, and carries with him the respect and good wishes of all connected with this department. Dr. William G. Kimball was appointed Assistant Port Physician, April 1, 1877.

In laying this report before you, gentlemen, it gives me pleasure to speak of the faithfulness of all officers employed in this department, also to express my thanks to you for the good counsel and encouragement which have at all times been extended to me.

Respectfully,

ALONZO S. WALLACE, M. D.

Port Physician.

QUARANTINE STATION, DEER ISLAND,
BOSTON HARBOR, May 1, 1877.

EXPENDITURES
OF THE
HEALTH DEPARTMENT.

EXPENDITURES OF THE HEALTH DEPARTMENT.

HEALTH OFFICE, CITY HALL, May 1, 1877.

TO THE HONORABLE BOARD OF HEALTH:—

Gentlemen,—In conformity with the Ordinance relating to Health, I herewith submit my report of the expenses of this department for the year ending April 30, 1877.

Amount appropriated	\$413,000 00
Amount expended	365,928 39
Balance, May 1, 1877	<u>\$47,071 61</u>

The above amount of \$365,928.39 was expended as follows:—

For money paid for labor in sweeping and cleaning the streets, and in the removal of snow and ice from public walks, yards, and squares	\$96,784 78
Paid for labor in the collection and removal of house offal from hotels, houses, stores, restaurants, in city proper, South Boston, Dorchester, Highlands, and Charlestown.	61,530 62
Paid for labor, collection and removal of house-dirt and ashes in city proper, South Boston, Highlands, Dorchester, and Charlestown,	92,539 09
Paid for labor in the cleaning cesspools in city proper, South Boston, East Boston, Highlands, and Dorchester	14,581 33
Official roll of office, including Milk Inspector's Department	8,500 00
Foreman, feeders, blacksmiths, wheelwrights, watchmen, painters, harness-makers, and drivers of prison carriages	24,598 50
For grain used at city stables, south and west, Boston Highlands and Charlestown	15,787 18
For hay and straw used at city stables, south and west, Charlestown and Boston Highlands,	<u>12,113 30</u>
<i>Amount carried forward</i>	<u>\$326,434 80</u>

<i>Amount brought forward,</i>	<i>\$326,434 80</i>
For the collection and removal of ashes in East Boston	6,199 50
Purchase of new horses and exchanges	12,340 00
For stock and tools of blacksmith shops	2,127 82
Stock and tools of wheelwright shop	1,354 43
Stock and tools of harness shop	1,401 35
Paints, oils, varnishes and brushes	846 68
Extra team-work in collecting ashes, etc.	579 00
Repairs on stables, south, west, and Boston Highlands	511 28
Fuel and gass for city stables	1,178 12
East Boston ferry-pass for men and teams	275 00
Medical attendance on horses, and horse medicines	422 36
Milk Inspector's office, for analysis of milk, stationery; advertising, etc.	351 33
Sawing and planing cesspool and other stock	226 28
Shoeing horses, West-end stable and Charlestown	378 83
Printing bill-heads, notices, blanks, etc.	262 54
Stationery for office and stable uses	119 00
Advertising	26 00
Stock for making street brooms	686 61
For the collection and removal of house-offal from East Boston, as per contract	3,000 00
For the collection and removal of house-offal from West Roxbury	1,500 00

Incidental expenses as follows : —

Refreshments and carriage-hire	\$495 25
Paid Mr. Harrington for injuries received from being bitten by a dog	100 00
Lard, oil, vinegar, salt, matches, flour, stove-polish, etc.	70 77
Oil and axle grease	53 44
Stabling horses at East Boston and West Roxbury	57 60
Ticking, sheeting, netting, cotton and crash	43 36
Directories, office use	27 50
Buffalo-robos	16 50

<i>Amounts carried forward</i>	<i>\$864 42</i>	<i>\$360,220 88</i>
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<i>Amounts brought forward</i>	\$864 42	\$360,220 88
Washing bedding and towels, city stables	15 00	
Repairing clocks and clock-dials	12 70	
Repairing stoves	12 30	
Boston Ice Company	12 00	
Daily Advertiser (office)	12 00	
Repairing gate broken by city team	10 76	
Timber scribe, locks, hinges, keys, handles, shot, and blacking	10 41	
Rubber hose cover	6 50	
Weekly dial, office use	5 40	
Carriage cushion	5 00	
Water-cooler (office)	4 75	
Umbrella for open buggy	4 00	
Blacksmiths' repairs on sundry vehicles	3 25	
Soft soap	1 50	
Adjusting city scales	1 36	
		981 35
Water-rates, 1877		1,256 30
Shovels, baskets, and canvas covers for carts, etc. (Ash Department)		260 68
Springs, flanges, manure-forks, hose, plate, buckets and bucket-bottoms, bails, etc. (Offal Department)		184 70
Poles, shovels, street hoes, oil, broom-cord, hose, pick-handles, lifter, and repairs on street-sweepers (Street Department)		1,947 40
Overalls, frocks, buckets, hoes, cesspool boots, and lumber for cesspool covers		579 52
Stock for stables, consisting of curry-combs, brushes, sponge, soap, blankets, manure forks, etc.		497 56
Total amount expended		<u>\$365,928 39</u>

There have been deposited for collection during the year bills amounting to \$26,890 53

There have been paid into the City Treasury, and the amount credited this department, for material sold during the same period, as follows : —

Sale of ashes	\$15,379 87
“ filling	1,698 10
Removing ashes	2,081 74
Old material sold	625 36
Manure sold	985 25
Street dirt sold	1,640 79
Labor (removing ashes)	29 44
Conveying prisoners	2,375 25
Offal sold	30,255 53
Cleaning cesspools	15 00
Entering sewer (Cove place)	50 00
Total amount collected	<u>\$55,136 33</u>

PRISON CARRIAGES.

There have been conveyed during the past year from the several station-houses to the city prison under the court-house, for which the Police Department is charged 25 cents per head : —

7,119 males ; 2,382 females. Total, 9,500.

Conveyed without charge (county prisoners), as follows : —

From Court-house to Jail	2,336
“ Jail to Court-house	808
“ Court-house to House of Correction	311
“ Court-house to Deer Island boat	5,607
“ East Boston to House of Correction	28
“ East Boston to Jail	104
“ Jail to East Boston	42
“ East Boston to Deer Island steamer	215
“ South Boston to Deer Island steamer	664
“ South Boston to Jail	176
“ Jail to Court at South Boston	52
“ South Boston to House of Correction	35

Total number conveyed 10,378

The sexes are conveyed in separate vehicles.

ASHES, STREET DIRT, ETC.

Collected by city teams : —

No. loads of ashes	112,722
“ “ street dirt.	52,967
“ “ cesspool matter	10,208
Total	<u>175,897</u>

The teams owned and employed in this department are as follows : —

55	carts for ashes.
29	“ street dirt.
42	wagons for offal.
12	“ cesspools.
9	sweeping machines.
3	prison carriages.
6	water-carts.
1	market team.

ASHES

from hotels, tenement houses, and stores are collected by the city teams twice in each week, and from dwellings once a week. Bills for the sale of ashes and other material are forwarded to the City Collector.

HOUSE OFFAL

from dwellings is collected three times a week during the summer, and twice in each week during the winter; from hotels, markets, and restaurants it is collected daily.

CESSPOOLS

belonging to the city are cleaned by this department, and their contents conveyed to some dump, and there immediately covered with ashes.

CESSPOOL COVERS.

876 new cesspool covers have been furnished to supply the place of such as have been found defective.

STREET-CLEANING.

During the season of street-cleaning the principal thoroughfares are swept daily, and others twice in each week. Occupants of stores and offices are requested to comply with our regulations, and cause their sweepings to be placed in proper vessels on the sidewalks, to be removed by city teams on fixed days.

SCHEDULE OF CITY PROPERTY

*In the South, West, Boston Highlands, and Charlestown
Stables.*

198 horses with harnesses, at \$300	\$59,400 00
4 express harnesses, at \$25	100 00
9 light harnesses, at \$25	225 00
2 spare lead harnesses, at \$15	30 00
1 breast harness (lead)	20 00
13 collars, at \$1.50	19 50
51 pairs hames, at \$6	306 00
6 new bridles, at \$7	42 00
11 martingales, at \$1.12½	12 37
2 hoisting harnesses, at \$25	50 00
227 halters, at \$1.25	283 75
167 strings sleigh-bells, at .75	125 25
58 shaft girths, at \$1.75	101 50
9 pairs reins, at \$3.25	29 25
6 sweat-collars, at \$2	12 00
20 collar-pads, at .20	4 00
10 horse slings, at \$1	10 00
1 new breast harness	75 00
10 new cart saddles, at \$21	210 00
3 new offal saddles, at \$15	45 00
2 old cart saddles, lot	8 00
13 offal breechings, at \$7	91 00
6 rubber horse covers	5 00
13 pair new blinkers, at \$2.50	32 50
14 pair hip ornaments, at .25	3 50
2 pair check-reins, at \$1.50	3 00
13 iron hame-fasteners, at .50	6 50
52 hame-straps, at .50	26 00
185 woollen blankets, with girths, at \$2.50	462 50
142 carts for collecting ashes and street dirt, at \$100	14,200 00
59 one-horse wagons for collecting house offal, at \$125	7,375 00
14 one-horse cesspool wagons, at \$150	2,100 00
<i>Amount carried forward</i>	\$85,413 62

BOARD OF HEALTH.

91

<i>Amount brought forward</i>		\$85,413 62
5 express wagons, at \$75		375 00
3 open offal wagons, at \$75		225 00
28 cart wrenches, at \$1.50		42 00
6 vehicles for conveying prisoners		1,200 00
8 open wagons, at \$100		800 00
1 old chaise		5 00
1 hay-rigging		75 00
3 top buggies, at		150 00
3 covered carriages		200 00
161 sleds for conveying ashes and offal, at \$50,		8,050 00
7 sleighs, at \$75		525 00
3 pungs		25 00
2 hand-sleds for removing snow, at \$3		6 00
8 drag boxes for same purpose, at \$1		8 00
45 snow-drays, at \$1		45 00
1 scraper, at \$10		10 00
2 snow ploughs, at \$10		20 00
1 ice-plane		10 00
13 sweeping-machines, at \$250		3,250 00
100 lbs. No. 2 reeds		20 00
11 brush rolls filled with flanges, at \$25		275 00
4 brush rolls without flanges, at \$24		96 00
3 lbs. brace thread, at .40		1 20
1 lot sweeping machine patterns		10 00
11 brush flanges, at \$2		22 00
1 set composition boxes with oil cups,		5 25
6 composition crank eccentrics, at \$2.25		13 50
2 composition pawe-lifters, at .75		1 50
24 oil cups, at .12		2 88
39 oil tubes, at .10		3 90
1 pitch pan and table,		10 00
40 lbs. pitch		1 00
527 lbs. bass, at .13		68 51
1 hay-cutter for cutting bass		10 00
9 water-carts, at \$250,		2,250 00
188 offal chisels, at \$2		376 00
95 offal buckets, at .50		47 50
7 offal tubs, at \$1.50		10 50
10 water-pots (lot)		5 00
5 goose-necks,		50 00
7,522 bundles broom stuff, at .08		601 76
69 baskets (lot)		15 00
52 ice chisels, at \$2.50		130 00
57 dipping-poles, at \$2.		114 00
<i>Amount carried forward</i>		<u>\$104,575 12</u>

<i>Amount brought forward</i>		\$104,575 12
86 cesspool hooks, at \$1		86 00
13 cesspool tools, at \$3		39 00
287 lbs. axle grease, at .10		28 70
5 tool-houses, at \$15		75 00
6 lanterns		2 00
109 cart covers, at \$1		109 00
20 cart covers, new, at \$2.50		50 00
1 clipping machine		3 00
541 ⁵⁸⁷ / ₂₀₀₀ tons hay, at \$20.50		1,123 26
301 ⁸⁰⁴ / ₂₀₀₀ tons straw, at \$22.50		699 79
128 lbs. oats, at .60 per bushel		2 40
400 lbs. meal, at .65 per bushel		5 20
300 lbs. shorts, at \$1.50		4 50
147 old street hoes, at .25		36 75
122 steel and iron shovels (new), at \$1.50		183 00
386 " " " (old), at .50		193 00
320 " " " at \$1		320 00
242 " hoes, at \$1.25 (new)		302 50
2 rammers, at \$3		6 00
5 hay-cutters, at \$60		300 00
6 six-tined forks, at \$2		12 00
208 water-pails, at .50		104 00
51 manure-forks, at .50		25 50
23 hay-forks, at \$1		23 00
3 pair steps, at \$3		9 00
2 stagings		20 00
2 window-frames		5 00
1 spare tool-chest		10 00
6 spare grain-chests		50 00
23 manure-hooks, at .50		11 50
5 feed-troughs and tools		150 00
Lot horse medicines		10 00
3 wheelbarrows		10 00
1 rubber hose		15 00
1 lot leather hose		100 00
4 tackle and falls		100 00
110 lbs. sponge, at \$1.50		165 00
1 dust-brush		1 00
12 gallons neats-foot oil		10 00
2 furnace and copper boilers		100 00
2 hoisting blocks		4 00
1 copper boiler		10 00
1 lot straw matting		20 00
3 gas-lighters		5 00
<i>Amount carried forward</i>		\$109,114 22

<i>Amount brought forward</i>	\$109,114 22
3 dripping pans	20 00
26 four-tined forks, at \$1.00	26 00
1½ doz. corn brooms, at \$4	5 00
13 hay-hooks, at .25	3 25
85 lbs. castile soap, at .15	12 75
5 zinc-iron hods	2 00
268 curry-combs and brushes (lot)	50 00
300 lbs. chloride of lime, at .06	18 00
300 lbs. copperas, at .06	18 00
2 iron bedsteads	10 00
4 ladders	10 00
4 grease-jacks	20 00
1 watch-clock	25 00
1 " "	25 00
7 hydrant wrenches, at \$3	21 00
2 composition hydrant chucks,	150 00
1 feather duster	1 00
3 reflector lanterns	10 00
32 lbs. rubber packing, at .75	24 00
3 carriage covers	5 00
Stock and tools in wheelwright's shop	200 00
196 cesspool covers, at \$1.12½	220 50
398 broom-handles, at .50	199 00
144 offal bucket bottoms, at .06½	9 00
1 keg 60 doz. buttons, at .06	3 60
25 doz. new offal buckets, at \$8	20 00
8½ doz. bucket handles, at .75	6 19
116 old cart hind-boards, at .75	87 00
1 brass flange for offal wagon	3 25
2,000 feet oak boards, at \$50	100 00
10,500 " " at \$50	530 00
1,400 spruce boards, at \$16 per M	22 40
112 mauls, at .25	28 00
71 scrapers, at .10	7 10
150 feet of hickory, at .10	15 00
3 sets light wheels	75 00
133 hubs, at \$1	133 00
2,000 feet unfinished stock, at .10 per foot	200 00
515 felloes, at .16	82 40
2,970 spokes, at .14	415 80
5,126 feet Canada pine, at \$55 per M	281 93
3½ sets offal-wagon wheels	150 00
4 sets buggy hubs, at \$1.25	5 00
2 pair cart-wheels	70 00
<i>Amount carried forward</i>	\$112,434 39

<i>Amount brought forward</i>		\$112,434 39
8 sets light rims		32 00
6½ pair buggy shafts, at \$1.66½		10 83
350 light spokes, at .15		52 50
1 lot of wood screws and tacks		10 00
66 lock sticks, at .75		49 50
50 pairs finished shafts, at \$5		250 00
2 steam-boxes		10 00
158 hind-boards to carts, at \$2.25		355 50
3 grindstones		10 00
1 pair hub rammers		30 00
1 lot old wheels		20 00
2 cross-cut saws		16 00
690 feet of ash, at .08		55 20
150 feet spruce planks, at \$16 per M		2 40
885 feet of cypress boards, at .05½		48 67
5 old offal bodies		25 00
1 pair iron hub wheels		36 00
Stock and tools in blacksmith's shop		500 00
2 set rubber cesspool springs		100 00
5 crowbars, at \$2.		10 00
46 pickaxes, at \$1.50		69 00
Lot iron gutters		70 00
3,187 lbs. cart and wagon axles, at .05½		183 25
744 wagon springs, at .16		119 04
50 lbs. patent shoes, at .07		3 50
302 " shoe nails, at .02½		61 67
293 " cast steel, at .16		46 88
29,028 " refined iron, at .02½		628 94
3,565 " Norway iron, at .05½		196 07
2,093 " corking steel at .8¾		183 14
21,305 " old horse shoes, at .01		213 05
11,948 " old iron, at .01		119 48
2,035 " band iron, at .03½		62 90
282 " cast iron sled shoes, at .05		14 10
110 " spring steel, at .08¾		9 62
4,283 " horseshoe iron, at \$100 per ton		214 15
200 two-inch shaft nails (lot)		1 50
3,739 lbs. sharpened shoes (new), at .12		448 68
3,838 lbs. toed and heeled shoes (new), at .10½		402 99
3,710 lbs. smooth shoes (new), at .09		333 90
328 lbs. bar shoes (new), at .14		45 92
2 sets brand irons		5 00
¼ doz. farriers' knives, at \$13		3 25
18 hammer-handles, at .16¾		3 00
<i>Amount carried forward</i>		\$117,497 02

<i>Amount brought forward</i>	.	.	\$117,497 02
2,000 3-in. dog nails, at .75	.	.	1 50
2 sets numbers	.	.	5 00
203 lbs. old wagon springs, at .05	.	.	10 15
1 wheel machine	.	.	25 00
1 boring machine	.	.	25 00
1 tire upsetter	.	.	25 00
1 tire bender	.	.	10 00
1 lot bolts, rivets and lag screws	.	.	97 03
1 lot horse rasps and files	.	.	29 26
1 drilling machine	.	.	15 00
1 set small scales	.	.	3 00
Stock and tools in harness shop	.	.	150 00
6 carriage weights, at \$1.50	.	.	9 00
4 muzzles, at \$2	.	.	8 00
1 horse-duster	.	.	1 00
25 new blankets (carpeting), at \$5	.	.	125 00
6 knee robes	.	.	15 00
8 buffalo robes	.	.	50 00
1 wool-skin	.	.	3 00
4 14-in. cart trees, at \$3	.	.	12 00
130 lbs. buffalo hair, at .10	.	.	13 00
			<hr/>
			\$118,128 96
			<hr/>

HORSE STOCK ACCOUNT.

1876.			1876.		
May 1.	On hand,	187	May 12.	Killed,	1
" 9.	Purchased,	3	June 20.	Exchanged,	1
June 20.	"	3	July 17.	"	1
July 1.	"	1	" 17.	Died,	1
" 17.	"	1	Aug. 10.	Killed,	1
Aug. 14.	"	1	" 10.	Died,	1
" 16.	"	1	" 14.	Exchanged,	1
" 15.	"	3	Nov. 8.	Killed,	1
Dec. 4.	"	2	" 17.	Died,	1
1877.			Dec. 4.	Exchanged,	3
Feb. 20.	"	4	" 5.	Died,	1
Mar. 12.	"	2	" 21.	"	1
April 16.	"	8	1877.		
" 18.	"	2	Feb. 9.	Killed,	1
" 16.	"	2	" 17.	"	1
		220	Apr. 16.	Exchanged,	2
			" 20.	Transfer Mt.	1
			Hope,		1
			Apr. 27.	Transfer Mt.	1
			Hope,		1
			Apr. 27.	" Deer	2
			Island,		2
			Apr. 23.	Sold,	1
			May 1.	On hand,	197
					220

Respectfully submitted,

GEORGE W. FORRISTALL,
Superintendent.

